THE MARINE REVIEW

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Now Are We Really "Up to Snuff?"

Why American Capitalists Do Not Establish Steamship Lines to South America—The Government Our Flag's Worst Enemy

In every issue hereafter this page will be devoted to an article of vital interest interpreting the principal events of the month in shipping circles. You will find it worth your while to read it regularly. It will be the aim of the editors to present material that no shipbuilder, vessel owner or manager can afford to miss and that every licensed deck or engineer officer in the merchant service will find helpful. A broad treatment will be necessary, but the object in view will not be indefinite. It is not our purpose to rehash news with which you are familiar, but to point out how the important events of the month bear on the progress and advancement of the American merchant marine. We use this term in its broadest sense, including not only our merchant marine on the high seas, but our splendid fleet of river, lake and coasting vessels, without which the American flag, at present, would scarcely ever be seen afloat. To be of maximum benefit to all, this page should reflect your views and opinions on the subjects discussed. Let us, therefore, hear from you frequently and freely. Consider this a personal invitation from the editor of The Marine Review.

FROM the Atlantic and the Pacific coasts there have come recently four widely different items of news, which, taken together, form a most illuminating commentary on the disastrous effects of our government's miserably conceived merchant marine policy. At the Pan-American conference, held at Washington late in May, we learned that lack of facilities for the transportation of passengers, freight and mail form the greatest obstacle in existence in the way of the development of closer commercial and social relations between the nations of the western hemisphere. Ships are not to be had, although the need for them is a crying one. Soon after the Pan-American congress adjourned, President Wilson told the assembled newspaper correspondents that in view of the tie-up of European trading vessels, American capital, "if it were up to snuff", would seize its opportunity and establish a merchant marine.

The casual observer, viewing the great need for more ships as brought out at the Pan-American conference and considering the President's remarks, should not be condemned for concluding that American capital is indeed not "up to snuff" when it comes to providing shipping facilities. For the casual observer—"the man in the street"—rarely has all the facts.

We are obliged to turn to the news from the Pacific coast to get at the real inside of this situation. One of these dispatches states simply that the Pacific Mail Steamship Co., operating, with the exception of one vessel, the only transpacific liners under the American flag, is not making freight engagements beyond July 31 and has scheduled no sailing dates after Nov. 2 and eventually will dissolve because of the cumulative effect of unfortunate legislation. The other Pacific coast dispatch informs us that the Dollar Steamship Co. may find it expedient to transfer several of its vessels to the Chinese flag in order to compete satisfactorily in the transpacific trade. This situation is not due wholly to any one law, but is the logical fruit of a mistaken national policy pursued over a period of years.

Everyone in any way connected with the shipping business should be anxious to see this policy corrected. No one wants the American flag driven from the high seas and some method can be devised to solve our present difficulties, with justice to all concerned, employer and employe, if only the American spirit of co-operation and fair play is allowed to come into action.

The American shipping industry is not suffering from lost manhood, but it does stand sorely in need of some real practical "New Freedom". In the midst of a great war, we find ourselves a nation without ships. This is due to the fact that our merchant marine policy has been controlled by politics and permitted to survive through ignorance.

Take the shipping question out of politics and throw a searchlight of information on the dark prairies of Illinois and Missouri, where there are millions of people who never saw even so much as a flat-bottom river packet.

Opinion is now shifting, but illuminating as the events of the past 12 months have been, the American public still needs a lot of educating on the merchant marine question. *Do your share.*

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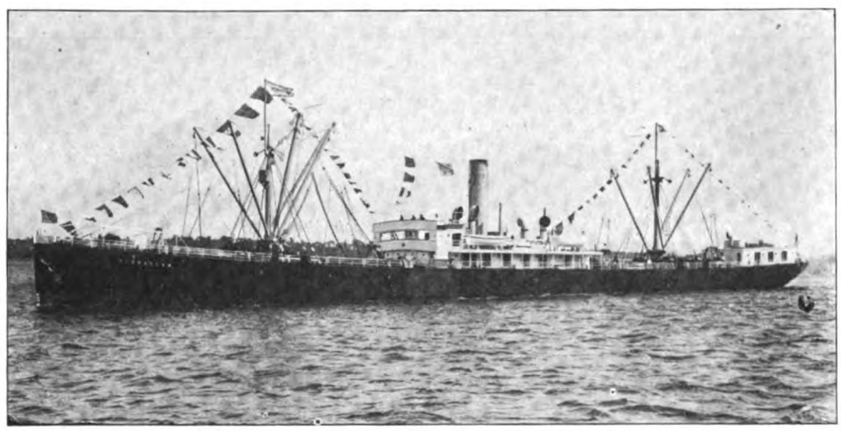
Violate Rights of Neutral Shipping

Crippling of the Nebraskan is Most Flagrant Infringement of American Rights on Seas European War Furnishes—Ship Homeward Bound in Ballast

FOURTEEN minutes after the steamer NEBRASKAN had hauled down the American flag on the evening of May 25, the chief engineer observed "a white streak in the water, perpendicular to the ship, on the starboard side." The shock that was almost immediately felt, was followed by an explosion that not only seriously crippled the vessel, but aroused anew the feeling in the United States against the continued violation of the rights of neutral shipping.

Direct evidence that the ship was torpedoed is lacking. An official report from the naval attache of the American embassy at London is said to be on its way to the state department at Washington. This report contains the findings as the result of an exhaustive investigation of the ship before and after she entered dry dock at Liverpool, together with sworn statements of the crew. The publication of this statement is awaited with an interest that is overshadowed only by the interchange of notes on the Lusitania case. While the exoneration of any of the belligerents from the charge of torpedoing NEBRASKAN will serve greatly in allaying public feeling, the remaining indictment of scattering floating mines over established trade routes will have to be met.



NEBRASKAN—BADLY DAMAGED NEAR ENGLISH COAST

The circumstances surrounding the crippling of NEBRASKAN constitute the gravest infringement on the rights of American ships encountered in the 11 months of warfare in Europe. She was bound *from,* not *to,* an English port. She carried *no cargo,* but was in water *ballast.* Her nationality was attested by the flag she carried until a few minutes before the explosion and by the name NEBRASKAN-NEW YORK painted in letters 8 feet high on her sides.

That under these conditions a submarine could have purposely attempted to send her to the bottom constitutes such a deliberate violation of American rights on the high seas, that this nation's willingness to seek another explanation is readily understood. However, floating mines long ago were recognized as being a menace to neutral shipping and as such the leading nations of the world have guaranteed not to use them. Either explanation is likely to prove highly unsatisfactory in meeting American demands that the rights of her ships be respected.

In a statement to a representative of *The Marine Review,* Henry Dearborn, assistant secretary and assistant treasurer of the American-Hawaiian Steamship Co., and son of G. F. Dearborn, president, confessed that the officials of his company, which owns the boat, were still unable to learn the actual cause of the damage to the ship.

"The vessel," said Mr. Dearborn, "was approximately 48 miles south of Fastnet Rock when the explosion occurred. At that time, she was traveling light and was headed for Delaware breakwater. The cause of the explosion still remains to be determined. After it occurred, NEBRASKAN put back to Liverpool immediately, where she took a berth preparatory to going into dry dock. The hull was examined by the American naval attache, under the instructions of Ambassador Page, who will submit a report to the state department at Washington.

"NEBRASKAN formerly was engaged in the traffic between San Francisco and the Hawaiian Islands. At present, she is under charter to the White Star line, which had loaded her with a general cargo for Liverpool, which port she had just left when the explosion took place. There was certainly no ground for torpedoing NEBRASKAN since there could be no mistaking her nationality, as she bore the sign NEBRASKAN-NEW YORK in 8-foot letters on each side."

The naval attache who made the examination of the crippled vessel at Liverpool was Lieut. John H. Towers. A summary of his report, given out a few days after the incident, follows:

"NEBRASKAN had left Liverpool bound for Delaware breakwater on the afternoon of May 24 and was in water ballast. She flew the American flag continuously up to approximately 8:10 p. m., May 25. At that time the flag was hauled down because the sun had set and the ship was considered at sea. The chief engineer of the ship, at 8:24 p. m., observed a white streak in the water, perpendicular to the ship, on the starboard side, and a severe shock was almost instantly felt, followed by a violent explosion abreast hold No. 1. Hatch cover No. 1 was blown off; also cargo booms above the same, and the air was filled with oil and debris, the double bottom compartments below hold No. 1 having been used for tanks for fuel oil. Bottom plating and pieces of the side were blown up through the decks. The ship settled immediately by the head and officers and crew took to boats. After remaining off the ship about one hour, they returned and headed the ship for Liverpool. Under orders of the British admiralty, a British naval trawler came up at midnight and remained with NEBRASKAN until she reached the mouth of the Mersey."

The examination after the ship had been placed in the dry dock at Birkenhead, showed a huge gap forward on the starboard side, 20 feet long and 12 feet deep at the bottom of the ship, which at this point had been blown away. All the plates surrounding this gap were curved inward.

NEBRASKAN is 360 feet long, 48-foot beam, 2,824 tons net and 4,409 tons gross register. She was built at Camden, N. J., in 1902. The ship left New York on her last trip east on May 7, for Liverpool, under command of Captain J. S. Greene, Philadelphia. She carried government insurance.

Her cargo on the outbound trip, as shown by a study of the ship's manifest,

(*Continued on page* 244.)

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Commission Divorces Boat Lines

Various Decisions of Interstate Commerce Commission Relating to Railroad Owned Steamship Lines Contradictory—Court Fight Probable

FLOUNDERING in a maze of contradictions and uncertainties, the interstate commerce commission has recently handed down a number of decisions which vitally affect many of the largest water transportation systems in the United States and may have a far reaching effect on the relations between railways and steamship lines in this country. Although, as in the tap-line case, the commission does not seem to be sure of its ground and not sufficiently familiar with the subject at issue to avoid contradictory action, it is evident that its main purpose, for the present at least, is to enforce an unusually strict interpretation of those portions of the Panama canal act relating to the railroad ownership of steamship lines. Apparently the commission desires to see an absolute divorce, as far as the law will permit, of railway and steamship interests in the United States.

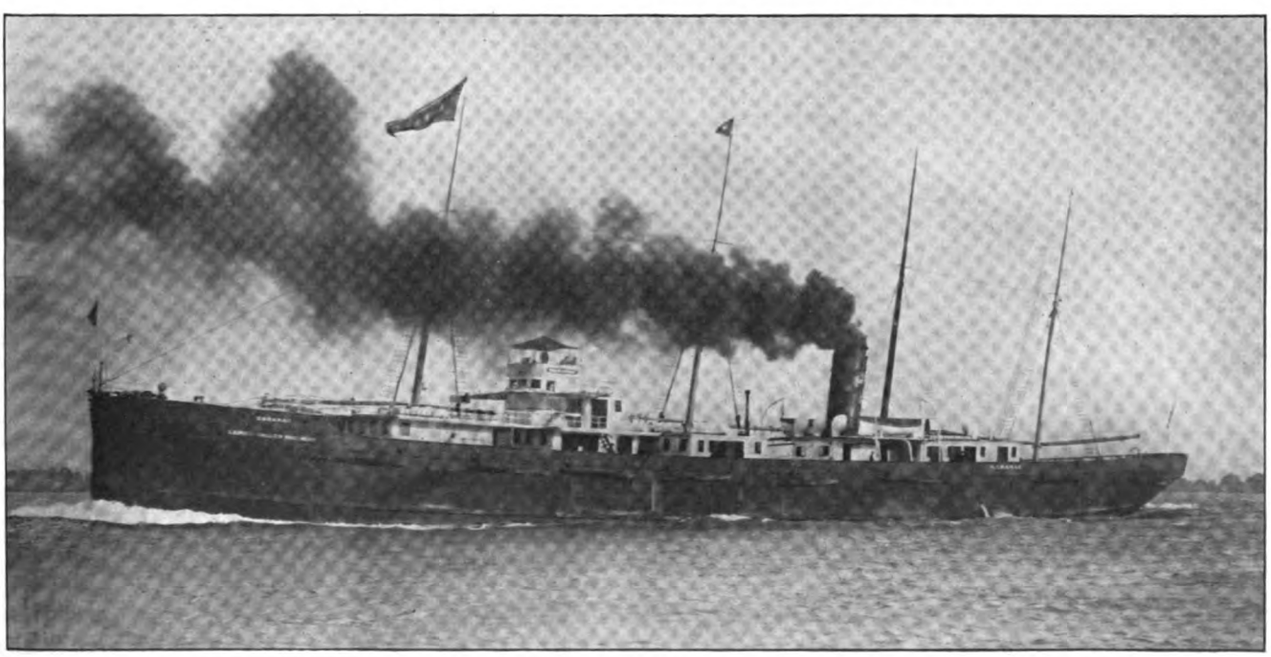
The law under which the commerce commission is acting provides that it shall be unlawful for any railway to control or have any interest in any common carrier by water operating through the canal or elsewhere, with which the controlling railway does or may compete. It should be noted, however, that this provision is qualified by another to the effect that if the interstate commerce commission believes any existing service by water, other than through the canal, is being operated in the interests of the public, and that an extension of time during which it is under the control of a railway "will not exclude, prevent or reduce competition on the route by water," the commission may extend indefinitely the period during which such service by water may continue to be operated.

The Situation in Brief

The interstate commerce commission, in administering the Panama canal act, has ordered the eastern trunk line railways to dispose of their steamship lines on the Great Lakes by Dec. 1, 1915; it has directed the Southern Pacific to dispose of its oil steamers operating between California and ports in Oregon and Washington by July 15, 1915; it has denied the application of the Spokane, Portland & Seattle railway, a Hill line, to retain ownership of its steamers on the Columbia river but has approved a similar application from the Oregon & Washington, a Harriman line, covering the operation of steamers on the same river. The railroads have not yet decided what to do. The commission's action probably will be contested and an effort may be made to have congress repeal certain sections of the Panama canal act.

In the administration of these provisions the commission has ordered the eastern trunk line railways to dispose of their steamship lines on the Great Lakes by Dec. 1, 1915. The commission also has ordered the Southern Pacific railroad to discontinue its ownership and operation of oil steamers between California ports and ports in Oregon and Washington by July 15, 1915. The commission has further ordered the Spokane, Portland & Seattle railroad to dispose of its steamers on the Columbia river, but in spite of this finding, it recently approved the application of the Oregon-Washington system, a Harriman subsidiary closely affiliated with the Southern Pacific, to retain the ownership and continue the operation of its boat line on the Columbia, Willamette and Snake rivers and on Lake Coeur d' Alene, Idaho.

The order relating to the railroad ownership of steamship lines on the Great Lakes is naturally of paramount interest because of the tremendous freight tonnage and large number of boats involved. Its actual effect upon lake and rail transportation is looked forward to with much interest. The



ONE OF THE LEHIGH VALLEY BOATS ORDERED SOLD BY THE COMMERCE COMMISSION

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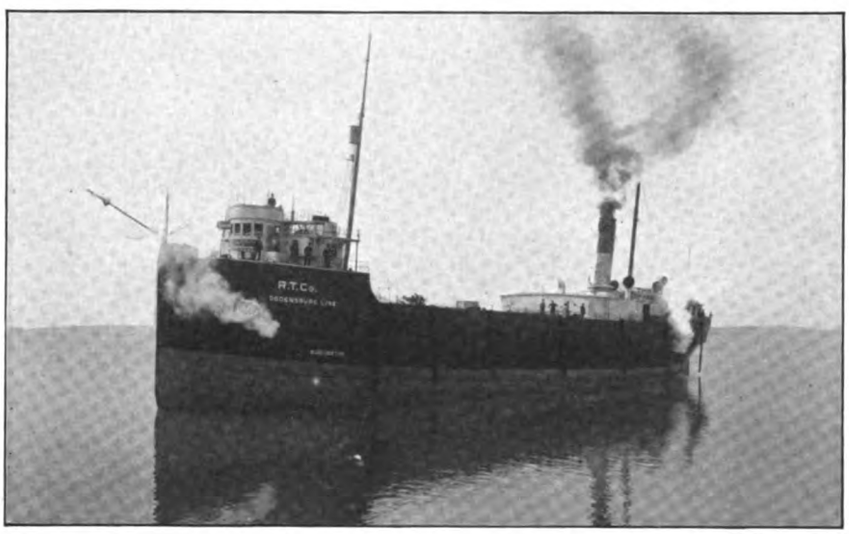
decision in the lake case was written by Charles C. McChord, chairman of the commission. The case is entitled "Lake Line Application under Panama Canal Act" (33 I. C. C. 699). An abstract of the decision is as follows:

"Several prominent boat lines are involved. The Anchor line, the Erie & Western Transportation company, is owned by the Pennsylvania railroad and operates 12 vessels serving Buffalo, Erie, Cleveland, Detroit, Mackinac island, Milwaukee, Chicago, Sault Ste. Marie, Marquette, Hancock, Houghton, Superior and Duluth. The Mutual Transit company, owned by the Mutual Terminal company, which in turn is owned jointly by the Lehigh Valley, the Erie, the Lackawanna and the New York Central, operates 12 vessels serving Buffalo, Fairport, Cleveland, Gladstone, Green Bay, Duluth, Houghton, Hubble, Fort William, Port Arthur and Westport. The Lehigh Valley Transportation company is owned by the Lehigh Valley and connects with it at Buffalo. The Western Transit company, owned by the New York Central, operates from Buffalo to Chicago and other Lake Michigan and Lake Superior ports. The Rutland Transit company, owned by the Rutland railroad, which in turn is controlled by the New York Central, runs boats between Ogdensburg, N. Y., and Milwaukee and Chicago. The Canada Atlantic Transit company, owned by the Grand Trunk, operates three steamers between Depot Harbor on Georgian Bay and Chicago and Milwaukee. The Erie railroad lake line, operated by the Erie, operates between Buffalo and Fairport and Milwaukee, Chicago and Manitowoc.



BURLINGTON, 2,285 GROSS TONS, RUTLAND TRANSIT CO.

"The commission finds that there is or may be competition for traffic between the vessels and the railroads interested in them within the meaning of the Panama canal amendment.

"There are no cases where any two ports are served in common by the boats and by the paralleling rails of the particular owning railroad entity. In the case of the Pennsylvania, the New York Central, the Erie and the Grank Trunk, however the railroad entity owning the boats or the interest therein also owns, or has an interest in, other railroad entities whose paralleling rails do serve ports in common with the boats. The interest existing between the several portions of each of these systems and the several boat lines in which it is a stockholder is the kind of interest which the act was intended to reach.

"The Lehigh Valley and the Lackawanna are each parties to through all-rail routes and joint rates to all the ports served by their boats. They are members of various fast freight lines, and are also interested in the Lake Line Association organization, the records of which indicate that its function is to insure a 'proper' management of the boat lines from the viewpoint of the railroads. While these two roads may not directly compete with their boat lines, their membership in this association or participation in any like understanding places them in a position inimical to the best interests of their boat lines. Placed in such an attitude these roads, through the agency of other roads, with which they are 'partners,' become the competitors of their own boat lines. What is here said with special reference to the Lehigh Valley and the Lackawanna also applies to the other roads.

"That the existence of paralleling through all-rail routes, which the petitioning railroad forms a part of, brings an application under this amendment within its provisions, seems clear when the amendment is considered in its application to the railroad interest in boats using the Panama canal. Neither at the time the amendment became a law, nor now, is there any trans-continental rail line owned or operated by a single railroad or system of railroads in the United States.

"The words of the law are as follows:

"'If the interstate commerce commission shall be of the opinion that any such existing specified service by water other than through the Panama canal is being operated in the interest of the public and is of advantage to the convenience and commerce of the people, and that such extension will neither exclude, prevent, nor reduce competition on the route by water under consideration, the interstate commerce commission may, by order, extend the time during which such service may continue to be operated beyond July 1, 1914.'

"The commission finds that it is not in the interest of the public that the rail carriers should continue their control over the lake lines.

"It is the opinion of the commission that the purpose of the Panama canal act is to preserve to the common interest of the people free and unfettered the 'water roadbed' via the Panama canal, and with respect to waters 'elsewhere' to restore all the water routes of the country to the same condition of freedom from domination that would reduce their usefulness as a natural means of transportation. Congress has decreed that there shall be a restoration of conditions which prevailed when railroads had no interest in and exercised no control over the boat lines plying the country's water routes. That the legislation might not be arbitrary, certain provisions were made so that in given instances which form exceptions to the usual experiences in cases of joint ownership such ownership may be continued. It is not found that the cases at issue constitute such exceptions.

"The petitioners have contended that the control of the lake lines by the rail carriers results in responsibility and regularity of the service. They allege that the joint ownership results in greater economies, particularly from the standpoint of terminals. They note that certain of the boat lines are being operated at a loss and that only the greater financial strength of the owning railroads enables them to operate.

"The commission agrees that no doubt under joint operation certain economies can be effected, but that these economies have not manifested themselves in a reduced lake-and-rail transportation cost of the public. On the contrary there have been advances. These successive advances have had the effect not only of preventing an increase in lake line tonnage, but in diverting from the

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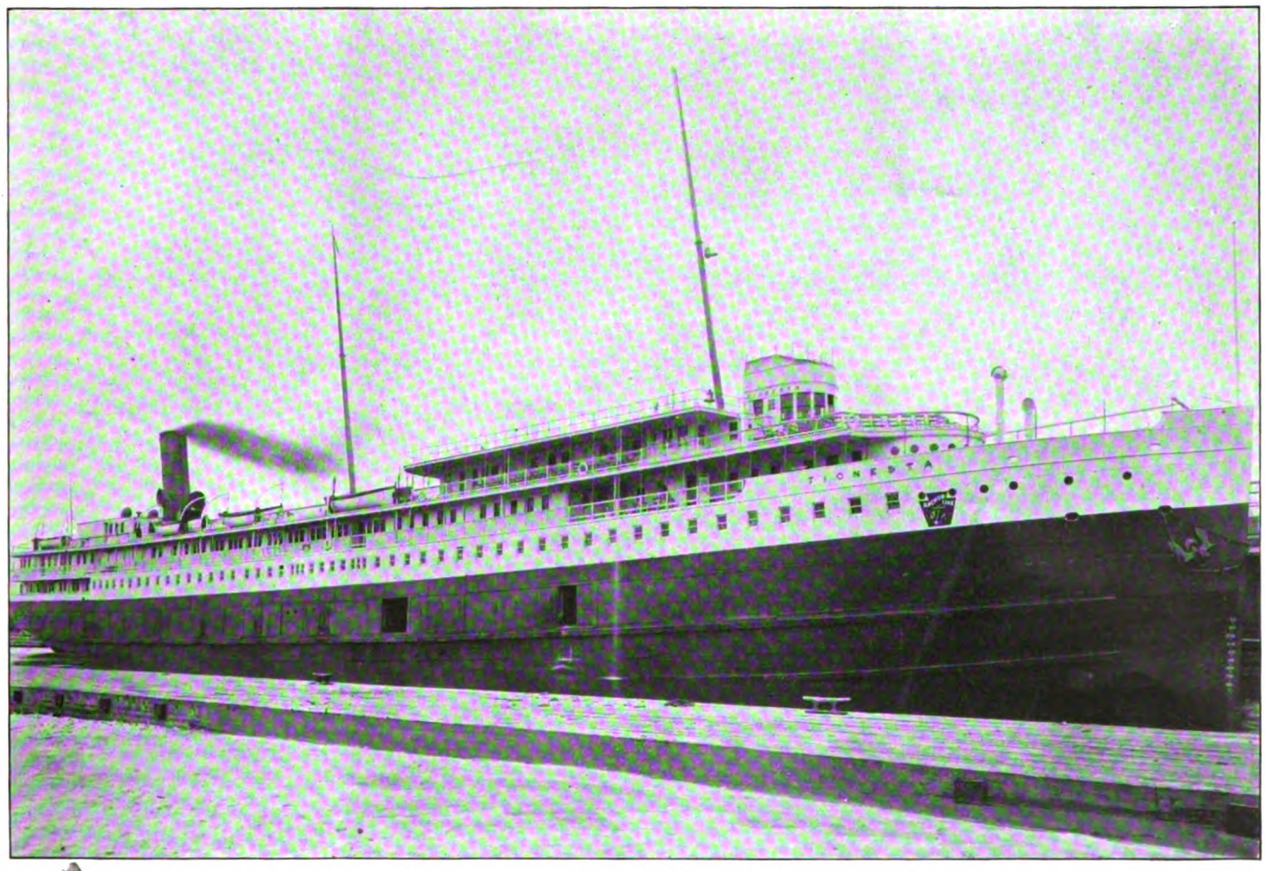
DELAWARE, BUILT IN 1905, OWNED BY PENNSYLVANIA RAILROAD



A GREAT LAKES RAILROAD OWNED PASSENGER LINER

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lake routes to the all-rail lines, part of the tonnage which formerly moved on the lakes. Furthermore there is much reason to believe that the very purpose of these advances in lake and rail rates was to divert tonnage to the all-rail lines. As a direct result, the boats have operated with small cargoes, although their operating expenses were almost as great as if they had been fully loaded. This has in turn resulted in a high operating cost per unit of freight. The commission believes that this policy fully explains the lake line deficit and that such facts make clear that whatever economies might be realized by joint ownership are offset by the waste resulting from the unfair use of vessel tonnage in the interest of the owning railroads. The railroad control of these boat lines cannot be said to be in the public interest when the policy of these railroads has been by an artificial rate structure to deprive the public of the natural benefits that would flow from a free use of this waterway.

"There are no instances where the boat lines have actively competed for traffic with one another or with the paralleling railroads under the regime of joint operation. Under independent operation each of the lines, in order to survive, will become a competitor of every other boat line and of the paralleling railroads, and the result of such operation will be reflected in the character of service furnished and in the rates. There will be a considerable advantage, moreover, in that these various boat lines, when independently operated, will be able to make through routes and joint rates with the boats which will be operated on the Erie canal barge lines.

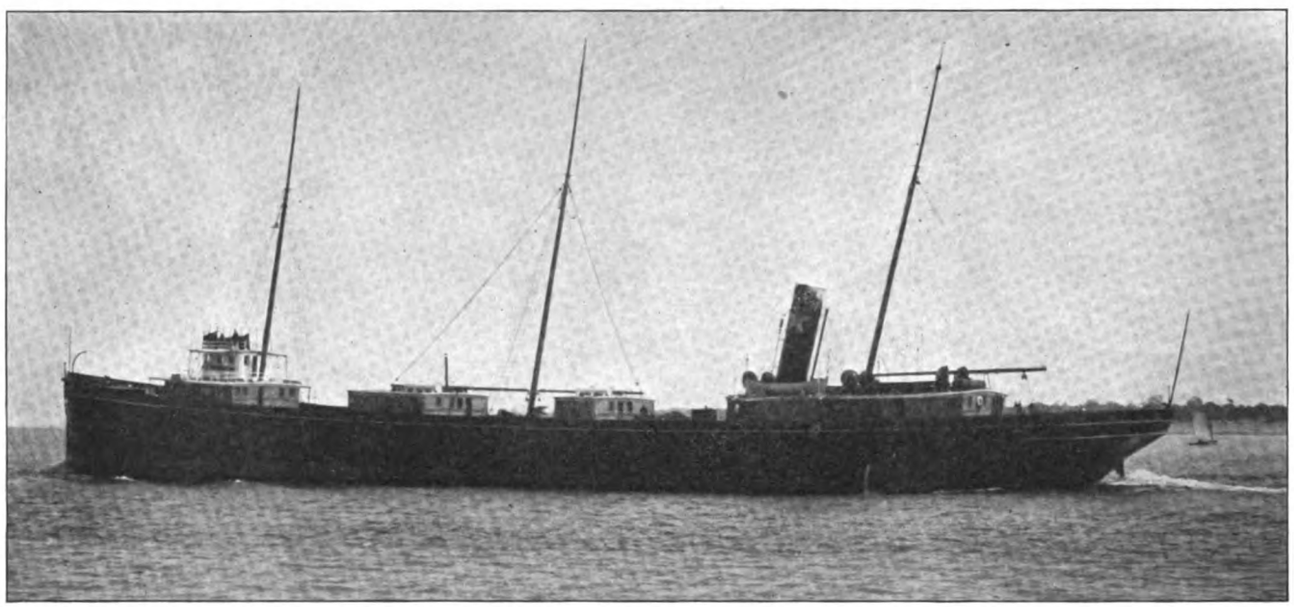
"These boat lines under the control of the petitioning railroads have been first a sword and then a shield. When these roads succeeded in gaining control of the boat lines which had been in competition with paralleling rails in which they were interested, and later effected their combination through the Lake Line Association, by which they were able to and did drive all independent boats from the through lake-and-rail transportation, they thereby destroyed the possibility of competition with their railroads other than such competition as they were of a mind to permit. Having disposed of real competition via the lakes, these boats are now held as a shield against possible competition of new independents. Since the railroads are able to operate their boat lines at a loss where there is now no competition from independent lines, it is manifest that they could and would operate at a further loss in a rate war against independents. The financial resources of the owning railroads make it impossible for an independent to engage in a rate war with a boat line so financed.

"The commission from a consideration of the above facts denies the petition of the carriers to retain control of the boat lines, effective, Dec. 1, 1915, and an order has been made to that effect."

This decision has stirred up a hornet's nest both in railway and marine circles and in order to give the railway point of view we quote the following extract from an editorial on the subject appearing in the *Railway Age Gazette,* May 21, 1915:

"The terms of the law make it plain that congress never intended that any railway should be required to dispose of its holdings in any water carrier with which it did not and could not compete. The language used makes it especially clear that congress never intended this with respect to railways having interests in boat lines on the Great Lakes and other inland waterways. How, then, does the commission reach the conclusion that railways which end where the service on the Great Lakes begins may and should be required to dispose of their holdings in lake lines? These railways have through rates and through routing arrangements in connection with railway lines operating between Buffalo and Chicago. The commission finds that by means of these through traffic arrangements with connecting railways, the Lehigh Valley and the Lackawanna are competing with their own boat lines, and it is on this theory that it bases its conclusion that their ownership of interests in boat lines is contrary to the law and to the public welfare.

In spite of the commission's labored and metaphysical reasoning, it is hard for persons not gifted with its powers of ratiocination to see how a railway which begins at New York and ends at Buffalo can compete with a boat line which begins at Buffalo and ends at Chicago. Common sense suggests that the competing with the boat line between Buffalo and Chicago must be done by some other railway, and common sense sometimes, although not always, has weight with the courts. The courts may also consider the fact that under the act to regulate commerce, the railways from New York to Buffalo may be required to make reasonable through rates and routes in connection with railways from Buffalo to Chi-



NORTHERN KING, OWNED JOINTLY BY SEVERAL EASTERN RAILROAD LINES

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cago, and that the commission is the body which is empowered to enforce this regulation.

"If all the eastern railways except those terminating at the eastern end of the lakes were required to dispose of their boat lines, there would be an increase of competition between the water carriers themselves and between them and the railways. A large majority of the lake lines would then be owned by industrial corporations and independent companies. The fact that some boat lines were owned by eastern railways terminating at Buffalo would not, it would seem, affect the competitive situation materially, if at all. If, at the most, it would affect it only to a slight extent, and nevertheless it can be held that the ownership of some boat lines by railways terminating at Buffalo, is against the public welfare, this can be only on the ground that the public welfare requires absolutely unrestricted competition of the water lines against the railways. As a matter of fact, this seems to be the very position the commission takes. It descants on the beauties of water transportation and the desirability of competition of waterways with railways in the rhetoric of an orator at a river and harbor congress. It says:

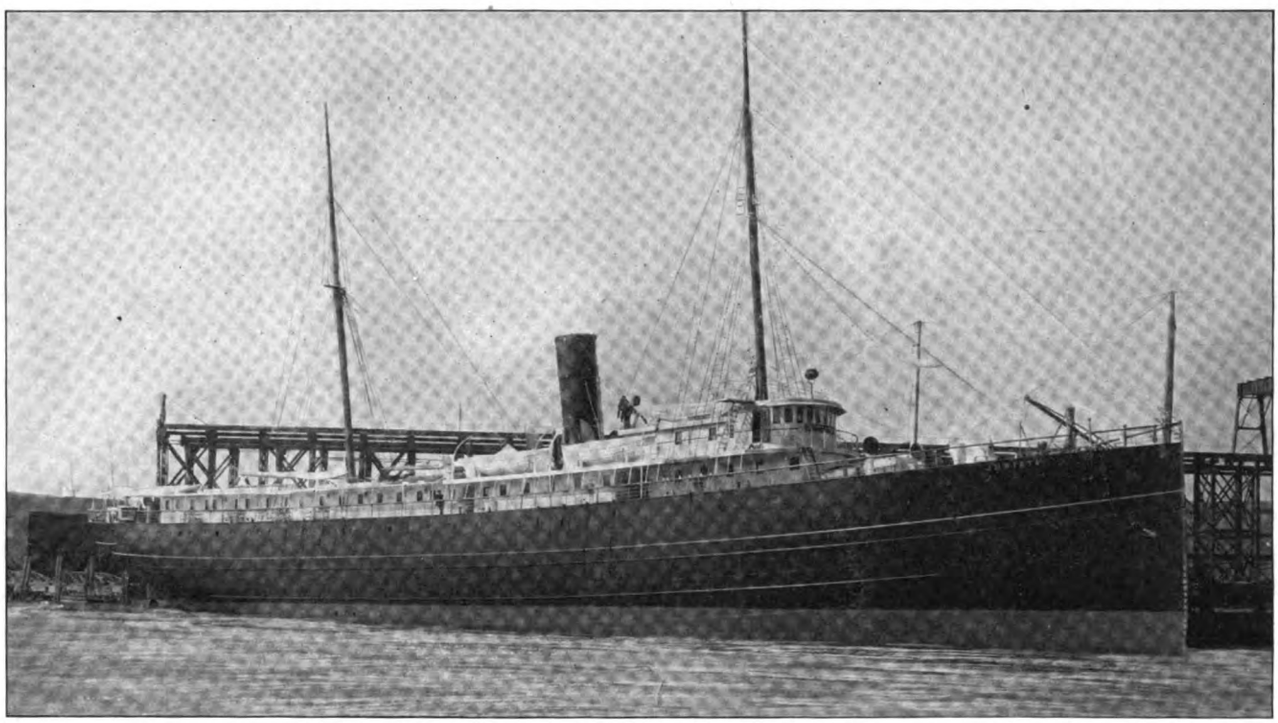
"'On a water course, where the boats and boat lines are free from domination or control by the railroads, and *where they are left to survive as their merit and the ingenuity of their owners makes possible,* there will be, and always is, a healthy rivalry between such boat lines themselves and with paralleling railroads for all suitable and available traffic. There is competition. This rivalry manifests itself in several ways. *The rates charged fluctuate according to economic principles,* and the shipper benefits invariably, as a result, lower charges for the transportation routed over such waterways and thereby reaps a return from the "nation's highway".'

Water Transportation From the Railway Viewpoint

"These statements — the italics in which are ours—cannot be supported by evidence. Seldom or never are boat lines on inland waterways 'left to survive as their merit and the ingenuity of their owners makes possible.' They are usually subsidized by government appropriations for the development of the waterways they use. As to the statement regarding, 'healthy rivalry and striving between such boat lines themselves, and with paralleling railroads,' there almost always are agreements between rival boat lines to limit competition between themselves, and the restrictions which the interstate commerce act imposes on the railways prevents 'healthy rivalry and striving' between water carriers and paralleling railways. Even with all the governmental aid and protection given water carriers it is not a fact that they are usually able to compete effectively with railways. The Mississippi is a deep waterway between Memphis and New Orleans. The carriers in that river are not dominated by railways; yet hardly a ton of freight moves by water between the terminals at Memphis and New Orleans. Less extreme examples could be cited all over the United States. The evidence all shows that the inland water carriers of the United States, excepting perhaps on the Great Lakes, cannot be made able to compete with the paralleling railroads even by government expenditures which cover a large part of the cost of handling the water traffic; and it is very questionable if independent water carriers on the lakes can hold as much of the traffic as has been held by the boat lines which have been controlled by the railways.

"As to the statement that 'the rates charged (by the water carriers) fluctuate according to economic principles,' it would be interesting to know whether the commission means by this to indorse the way in which rates by water commonly are made. The 'economic principle' on which they usually are based is that of 'charging what the traffic will bear.' Sometimes they are high and sometimes they are low. They may be low for one shipper and high for another shipper of the same commodity, moving on the same boat. The one shipper may get a rebate and the other may not.

"It is somewhat surprising to find the commission assuming in the opinion in this case, the same attitude of a mother to water transportation and a stepmother to rail transportation which is assumed by congress and a large part of the public—and that not the most intelligent or least prejudiced and disinterested part of the public. Perhaps in doing this the commission is merely reflecting and carrying out what it understtands to be the will of congress and the public. But have we not a right to expect an expert body charged with the duty of regulating



JUNIATA, ONE OF THE ERIE & WESTERN BOATS AFFECTED BY THE COMMISSION'S ORDER

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both rail and water transportation to reason and act on better information and sounder principles than the legislative body and the public which have delegated certain functions to it on the assumption that the exercise of those functions requires expert knowledge and judgment?"

Shipping men however are vitally interested in learning what actually will be done in regard to the decision and how it will affect the alignment of the railways and steamship interests on the Great Lakes. Sufficient time has not yet elapsed for the railways to formulate a detailed plan of action but, in spite of certain statements to the contrary, it is believed that the commission will not be permitted to put its order into execution without first threshing the matter out in the United States courts.

The assistant to the president of one of the railroads involved, commented as follows in regard to the matter to a representative of *The Marine Review*: "We have not even had any preliminary advice on the commission's decision from our general counsel as yet. Before anything is done as to the disposal of the boat lines, there undoubtedly will be a meeting of the executives of the roads involved to determine what line of action shall be pursued. After that the presidents of the roads will report to their respective boards of directors, so that it is unlikely any definite course of action will be decided upon for some time to come. We have plenty of time, however, since the order established Dec. 1 as the date by which the boats must be disposed of and from that I am inclined to think we really have until the opening of navigation next spring. At this time I should say that we see only two courses of action between which we might choose: That we sell the boats and dispose of our water transportation business altogether or that we cease to run the boats, and of course it is unlikely the latter policy would be adopted. I rather think it is unlikely that the railroads would care to take an appeal from commerce commission's decision or combat the order. In the first place I do not believe the ownership of the boat lines is of sufficient importance to the roads to make them want to hang on. In the second place," he added with a smile, "it is getting more and more customary for the railroads to accept whatever fate, in the guise of such decisions, offers them."

This opinion, from a high authority simply shows that the railroads executives are not in complete accord in regard to the course of action to be taken, for it has been learned from other sources that some of the railways are in favor of making a strong fight. It even has been intimated that every effort will be made to have the Panama canal act amended immediately upon the reassembling of congress so as to shear the interstate commerce commission of some of its power over boat lines. It is pointed out that the portion of the canal act under discussion was passed in response to a public clamor, stirred up by anti-railroad agitators, and that the policy laid down in the law is, as a matter of fact, contrary to public welfare. No immediate divorce of the railroad owned steamship lines on the Great Lakes therefore is in sight. If the matter should be taken into court several seasons might elapse before it is finally adjudicated.

If however the railways should decide to accept the commission's ruling without a fight, it is probable that a holding company will be organized to buy up the boat lines and operate practically all of the package freighters on the Great Lakes under one centralized control, independent of the railroads. Some of the details of this plan already have been considered and the apportionment of the proceeds of the sale has been tentatively agreed upon.

On the Pacific Coast

Turning now from the lake case to the Pacific coast, the greatest surprise has been occasioned by the announcement that the commerce commission has approved the application of the Oregon-Washington system to retain ownership and continue operation of its boat lines on the Columbia, Willamette and Snake rivers and on Lake Coeur d' Alene. Only a short time previous to the announcement of this decision, the commission decided that the Spokane, Portland & Seattle railroad could not operate a similar fleet of steamers on the same river, approximately between the same ports. The Columbia river is the principal waterway involved in this matter. The Spokane, Portland & Seattle railway runs along the north bank of the river for about 220 miles, connecting Spokane, Wash., with Portland, Ore. The Oregon-Washington Railway & Navigation Co. operates a railroad along the south bank of the river for approximately the same distance, connecting Portland with southern Idaho and eastern points. The Oregon-Washington line is simply a fraction of the great Harriman transcontinental system and the Spokane, Portland & Seattle likewise is nothing more than a division of the Hill system.

It is therefore difficult for persons not versed in the mazes of interstate commerce law to understand how steamships operating for a few miles on a western river can effectively compete with these great railway systems. It has been facetiously suggested the interstate commerce commission fears that BAILEY GATZERT, HARVEST QUEEN or some other well known stern-wheel river steamer might operate through the Panama canal surreptitiously in the interests of one of the great transcontinental railway systems.

The decision relating to the operation of oil steamers on the Pacific coast by the Southern Pacific railroad seems to be equally intelligent. In this case the commission has ordered the boats sold, although it took a directly opposite stand in regard to the river steamers owned by another branch of the Harriman system. In the Southern Pacific case, however, the commission graciously granted a conditional permission to the railroad to continue its ownership and operation of oil steamers to Alaskan and foreign ports and also held that the Southern Pacific railroad does not compete with oil steamers operating to the Hawaiian islands and the Southern Pacific company may, therefore, continue this service. Shipping circles undoubtedly are greatly relieved to learn that there is no danger of oil being carried half way across the Pacific in tank cars.

The Pacific coast railroads have not yet announced what action they will take in regard to these orders and it is probable that it will depend, to a degree at least, upon the course which is pursued in connection with the Great Lakes case.

The 1915 edition of Lloyds Register of American Yachts has been issued. It contains, as usual, a list of the power and sailing yachts, yacht clubs and yachtsmen of the United States, Dominion of Canada and the West Indies, together with a yachting trade directory. The new edition, as usual, is bound in blue cloth with gold edges. It contains 488 pages and numerous colored plates of yacht ensigns.

A. W. Clark, chief engineer of the Duluth & Iron Range Railroad Co., Duluth, Minn., has issued his annual blue print showing the status of shipping ore docks on the great lakes as of May 1. The only changes in the statement are the addition of Dock No. 5 of the Duluth, Missabe & Northern Railway Co. and the shortening of Dock No. 2 of the Duluth & Iron Range Railroad Co. from 1,280 feet to 888 feet.

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Displays Interesting to Nautical Men

AN OPPORTUNITY to acquire a liberal education in maritime affairs will be afforded the visitors to Panama-Pacific exposition in San Francisco, owing to the fact that the marine exhibits are unusually complete and interesting.

The main purpose of each of the participating steamship concerns has been to exhibit ships and never before have so many models of vessels been assembled together. There are more than 20 in the palace of transportation alone and others are scattered among the other palaces. They range from the ancient war galley of the sixteenth century to the new and modern White Star liner BRITANNIC, the latter representing the last word in marine construction.

To grasp comprehensively the significance of the vast development made in the construction of ships, it is first necessary to visit the Japanese section in the palace of transportation. Here is seen an exact miniature of the galley used by the Koreans when they waged war against the Japanese in 1592. Next comes the model of the galley-yacht TAIHO MARU, which was built to the order of Lord Kumamoto more than three centuries ago. The original of this model sailed the Inland sea and was used to demonstrate what was then known as a modern vessel.

Another miniature craft in this exhibit is that of the war galley TANCHI MARU. This is typical of the class of war craft used about 1630; the motive power consisted of 38 sweeps on each side. In addition, a huge lanteen sail was utilized to catch the fresh breezes off the Japanese coast. This class of galley has two decks and was popular with the fuedal lords who roamed the seas and gave lavish entertainments beneath ornate canopies spread over the upper deck. The smaller galleys were propelled by fewer sweeps.

A 7-foot model representing the modern battle cruiser HARUNE, a 27,500-ton fighter, is perhaps the feature of the Japanese display. This vessel was built by the Kawaski Dockard Co. at Kobe. The model is of aluminum and is true to every detail. The same perfect detail of workmanship is found in the construction of the 9-foot replica of the steamship CHIYO MARU, the original of which is used in the trade between San Francisco and the Orient, operated by the Toyo Kisen Kaisha.

In point of workmanship, the model of BRITANNIC is representative of the most skilled perfection wrought by the mechanical artists of Europe. The model is 12 feet in length and the detail represents the original so faithfully that the winches and pulley blocks, although but a fraction of an inch in size, appear real enough to be used. The lifeboats and electric launching davits attract considerable attention, because their installation followed the loss of TITANIC and mark a complete change from the system used before the disaster.

The model shows 48 boats, two being power launches. The racks contain six boats each. The apparatus is so arranged that if through necessity it is desirable to lower all of the boats from

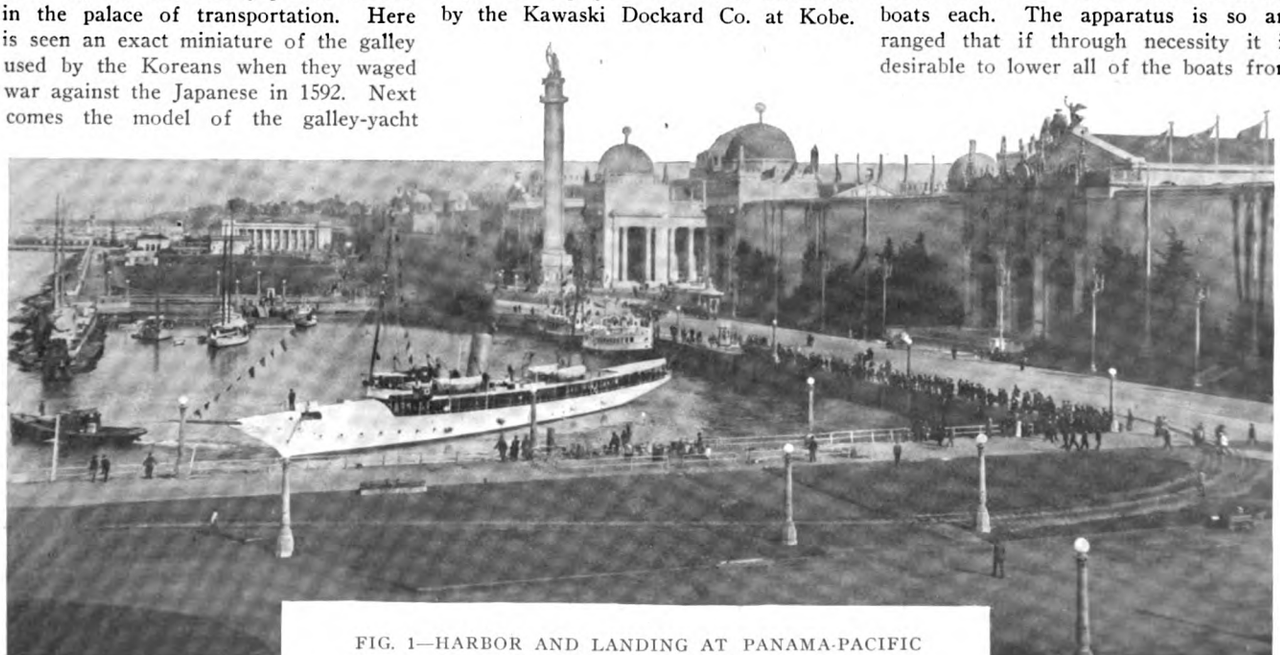

FIG. 1—HARBOR AND LANDING AT PANAMA-PACIFIC INTERNATIONAL EXPOSITION

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one side, this may be accomplished without difficulty. Every feature of the big liner is faithfully reproduced on a small scale, even to the arrangement which permits the use of lights, wireless and the deck equipment after the engine rooms have been flooded with water and the main machinery rendered useless.

Other models of the White Star fleet which have been installed include the following: OCEANIC, TEUTONIC, CELTIC, OLYMPIC and the original BRITANNIC. The Red Star Line exhibits the original BELGENLAND, the new addition to the fleet similarly christentd, also WESTERNLAND, KROONLAND, FINNLAND and ST. LOUIS.

The representation of the original BRITANNIC attracts the attention of thousands each day and scarcely an hour passes without a comment being heard from some visitor who has at some period in his experience crossed the Atlantic in the one time popular vessel. The original ship's bell, mounted on solid oak with a brass plate recounting the vessel's history, is also exhibited.

A Full-Sized Ship Section

The Holland-American Line has expended a considerable sum in the installation of an exact and full-sized replica of a section of the interior of STATENDAM, the new liner now under construction at Belfast by Harland & Wolff. There is shown a first cabin suite, a regular first cabin, and a third class cabin together with the kitchen and dining room. When the visitor enters the ship section, he is to all intents and purposes on the big 45,000-ton ship, and all that is lacking is the faint vibration of the powerful turbines.

The full-sized reproduction of a real liner attracts so many persons that the attendants are kept busy answering questions. The details of the workmanship are so perfect that but few persons are aware of the fact that what appears to be heavy and massive steel, is not metal, but wood. By installing this exhibit, the Holland American Line is making it possible for thousands of persons who have never even seen a big liner, to understand at first hand the real conditions on board a vessel of this class.

The American-Hawaiian Steamship Co., which operates 26 steamships between ports of the Atlantic and the Pacific through the Panama canal, has installed a duplicate section of the big freighter AMERICAN in the transportation palace. The visitor steps on board the main deck of the ship, climbs to the boat deck, peers into the wheelhouse and chart-room and then ascends to the bridge.

Everything pertaining to the navigation of the vessel is at hand and as a reasonably high wall encloses the exhibit and shuts off the view of the surroundings, it requires but little imagination for the stranger to believe himself to be on board a real ship. A quartermaster chosen from among those employed by the company is on hand and is prepared to answer all questions. The landlubbers are not slow to avail themselves of the opportunity and many leave the navigation bridge with a proud knowledge of nautical expressions in addition to a fair education concerning what's what on a vessel.

Looking down from the bridge of AMERICAN, a huge map of the United States, Mexico and Central America, down to the Isthmus of Panama, is seen. The route of the steamers of the American Hawaiian company between the Atlantic and the Pacific is shown, together with the names of the majority of the fleet. This exhibit forms a concrete example of the advantages of an American merchant marine, and this remark is frequently heard from the visitors.

The Pacific Coast Steamship Co. has installed a novel display to attract attention to its service between Pacific coast ports and also to Alaska. On one side a section of a steamer has been built. This represents a parlor, bedroom and bathroom of one of the suites of either PRESIDENT, GOVERNOR or CONGRESS. C. D. Dunann, passenger traffic manager of the company, has a well-equipped office aft, and steamship and transportation visitors from all parts of the world congregate there and receive a welcome.

The Alaska Steamship Co. and several other steamship concerns are preparing to install their exhibits in the transportation palace. Each will illustrate the routes over which the steamers of each line operate.

More Models

Within the walls of the palace of agriculture will be found more models of ships. The Union Steamship Co., of Dunedin, has placed the models of four of its ships in the New Zealand concession. They are, TAHITI, MAHENO, TAFUA and NIAGARA. The latter is the latest addition to the fleet to be placed in commission and is now operating between Sydney, Honolulu and Vancouver. TAHITI plies between Sydney and San Francisco.

Another score of models depicting the art of the shipbuilder is located in the palace of machinery. This has been provided by the United States government and has been moved from Washington during the exposition period. Models of several U. S. cruisers, battleships, submarines, gunboats and also vessels in the service of the coast guards also are shown. The attendant in charge of the latter exhibit is a veteran of the department which was until recently designated as the revenue cutter service and is kept busy throughout the day explaining the work of this branch of the government. An interesting model of the ancient brigantine-cutter DOBBIN, which was one of the original vessels of the service, is shown. A model of the derelict destroyer SENECA, one of the modern coast guard craft, also is displayed. This vessel is painted green, the color being used to notify all other vessels of the identity of the destroyer. Several models of the earlier types of revenue cutters with side wheels also are shown.

The Exploits of Bear

The model of the historic cutter BEAR is one of the most interesting in the collection. This is a perfect model in every detail and the unusual feature is that the miniature replica of the Artic cruiser was built on board during her last cruise to the far north. It is a product of the workmanship of Seaman A. Rehnstrom. When BEAR returned to civilization, the model excited the admiration of the entire department and it was decided to include it in the government exhibit.

Upon the walls of the coast guard concession hangs a photographic reproduction of an official commission bearing the signature of George Washington. This is dated March 21, 1791, and appoints Hapley Yeaton, of New Hampshire, to the position of master in the revenue cutter service.

The various bureaus of the department of commerce are represented in the palace of machinery by a splendid exhibit of the apparatus utilized by each. Lights, etc., of every description and for every possible use are on display. This includes an assortment of gas buoys, float lights, submarine signals, whistling buoys, day beacons and aids to navigation, with which mariners are familiar.

In the same building collections of life-saving apparatus and appliances have been placed. The government exhibit is ample and complete. It contains numerous models of vessels, a sample being at hand to represent every type of craft in existence.

The average visitor to the exposition knows but little about ships and shipping. The majority come from the interior and in many instances have never seen a steamer. They are familiar with photographs and illustrations of ships, but have never investigated them at close range. To this class of people the marine exhibit constitutes a liberal education. The information gained within the exposition buildings is supplemented by the observations which may be made from the Marina, the road skirting the grounds of the ex-

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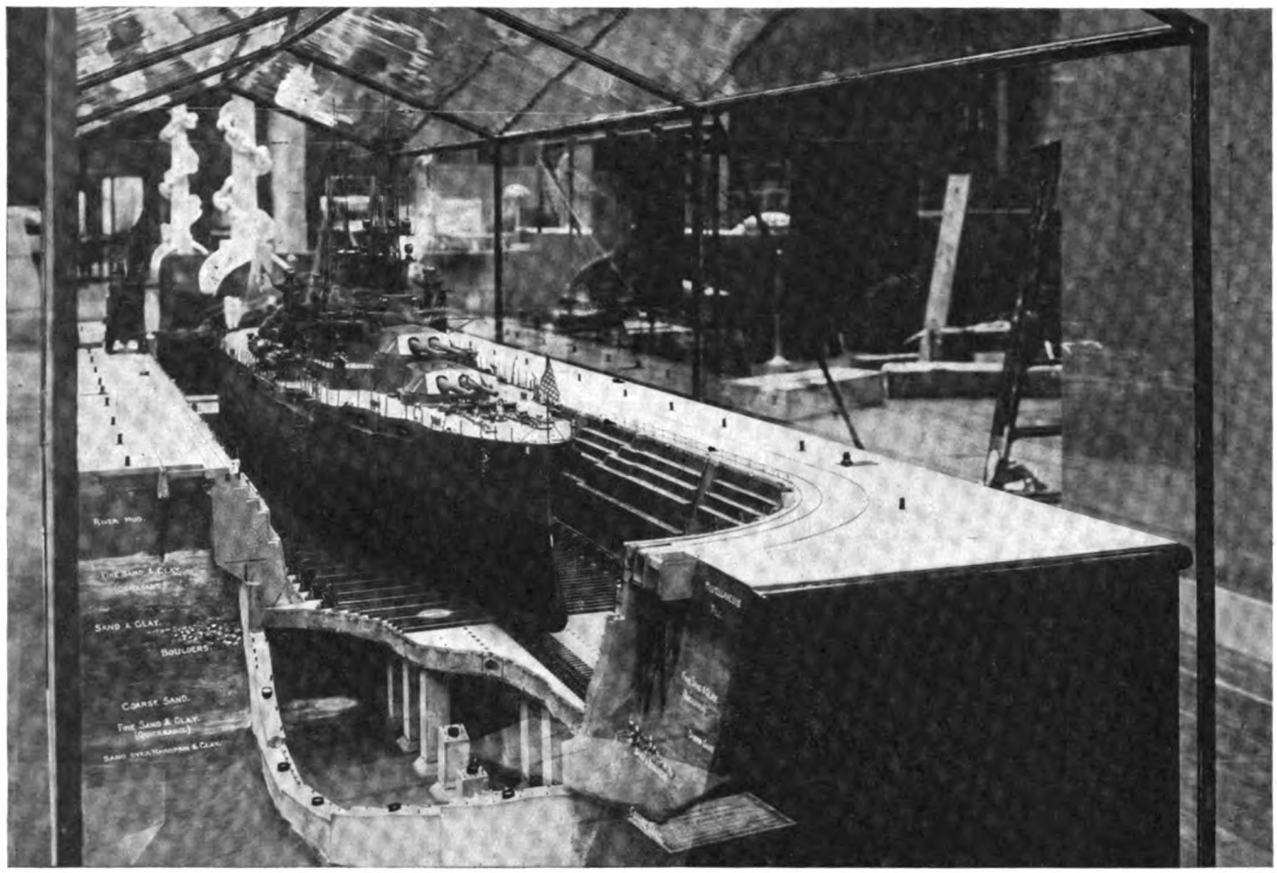

FIG. 2—MODEL OF A BATTLESHIP IN DRY DOCK WITH SECTION SHOWING CONSTRUCTION OF THE DOCK

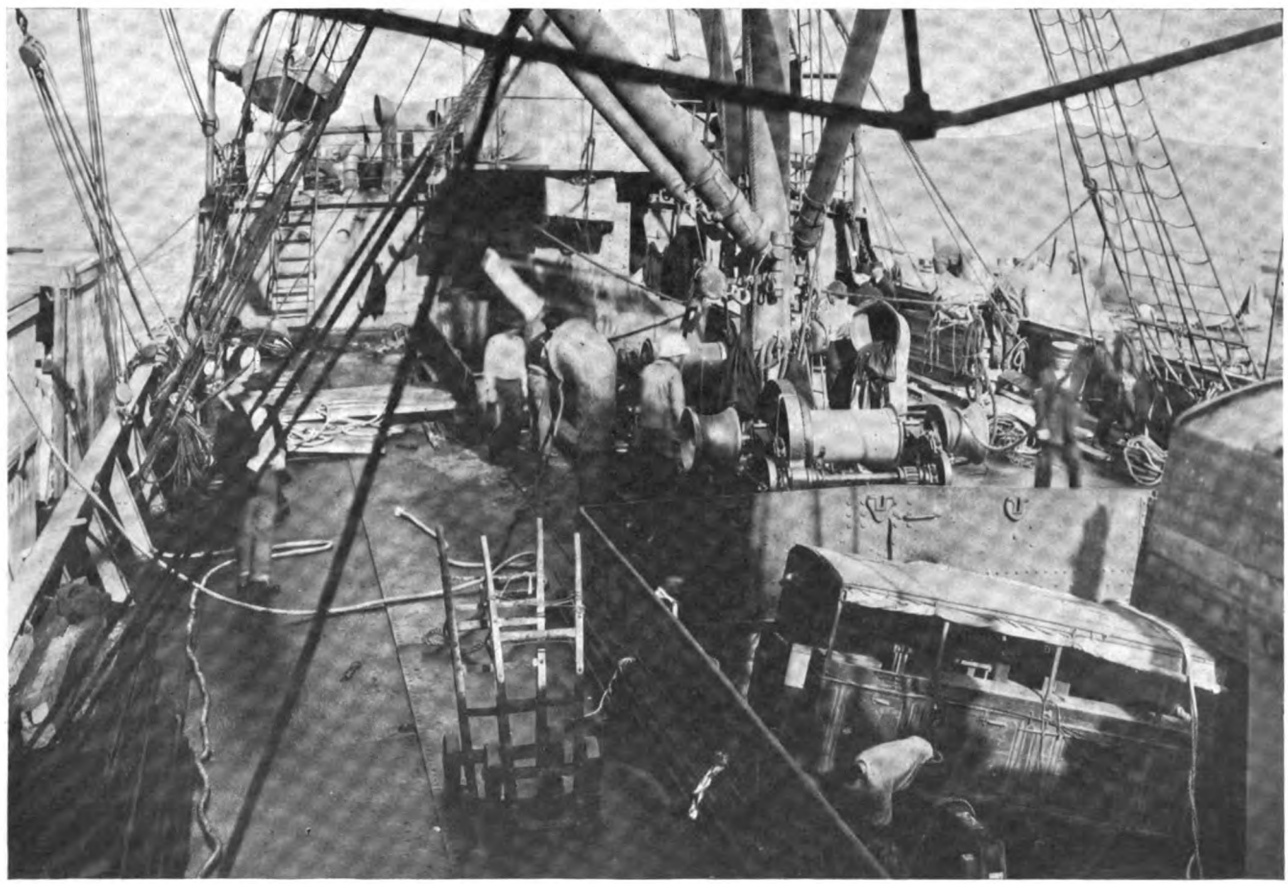

FIG. 3—UNLOADING UNITED STATES GOVERNMENT EXHIBITS FROM TRANSPORT IN SAN FRANCISCO HARBOR

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position along the bay. Only a few hundred yards from the beach are anchored the battleship OREGON and several torpedo boats, while numerous vessels entering and leaving San Francisco bay are constantly passing. The marine features of the exposition are most significant, for the whole wonderful achievement was brought into existence only because of the completion of the Panama canal, which in its turn was built to serve the maritime interests of the world.

The Nebraskan Case

(*Continued from page* 234.)

was of a general character and consisted almost entirely of merchandise that has not been declared contraband. The only contraband articles were four cases of rifles, a few cases of cartridges and a small tonnage of spelter.

Oil Calms Sea

Capt. S. G. Lloyd, of an American transport, reports that while running before a heavy northwest gale on Dec. 19 and 20, 1914, very heavy seas kept breaking aboard, smashing and shifting the deck cargo of cases. Oil was found to be very beneficial and less water was shipped after its use. Two drums with four small holes punched in the bottoms were placed in the forward closets and boiled oil allowed to run out of them. Thirty gallons of oil were used.

The International Oxygen Co. has issued from its general sales office, 115 Broadway, New York City, an extremely interesting 24-page booklet entitled "I. O. C. System Production, Pure Oxygen and Hydrogen". This booklet is profusely illustrated, showing installations made in various parts of this country and abroad. It dwells chiefly on the economy of the production of oxygen for cutting and welding by the I. O. C. System.

The Lagonda Manufacturing Co., of Springfield, O., has published a booklet entitled, "Lagonda Boiler Room Specialties." This booklet describes and illustrates several types of boiler tube cleaners with latest improvements and boiler quick repair tools. It also covers automatic cut-off valves and multiple strainers.

The next annual meeting of the Society of Naval Architects and Marine Engineers will be held on Thursday and Friday, Nov. 18 and 19, in the Engineering Societies buildings, 29 West Thirty-ninth street, New York.

New Tugs for Panama Canal

Tow Boats Fitted With Wrecking Pumps And Equipped With Powerful Engines

Fig. 1—Tug Tavernilla at Full Speed

THE Staten Island Ship Building Co., Port Richmond, S. I., N. Y., has just completed two tugs for use in the Panama canal and approaches, named GORGONA and TAVERNILLA, after two canal zone settlements which were later submerged by the rise in the level of Gatun lake. The two tugs are identical in measurement, equipment and finish and cost $150,000 each. Their principal dimensions are: Length over all, 125 feet 6 inches; length between perpendiculars, 112 feet; breadth on deck, 30 feet; depth, molded, low point, 17 feet; mean draft loaded, 13 feet 3 inches.

Compound Engine

The propelling engine is of the vertical inverted compound surface condensing type, having cylinders 24 inches and 50 inches diameter with stroke of 30 inches, developing 1,000 horsepower at 100 revolutions per minute under a steam pressure of 150 pounds. The engine is fitted with an independent surface condenser and an independent air pump. The crank shaft for the propelling engine is of the built-up type. The main portions of the propeller shaft are 11¾ inches in diameter; the diameter is 12 inches at the bearings. The propeller is of cast steel 11 feet 6 inches in diameter with a pitch of 14 feet 6 inches.

Steam is supplied by two single-ended Scotch boilers, 12 feet 6 inches by 12 feet, provided with two 44-inch corrugated furnaces. All circular seams are double riveted. Longitudinal seams are double butt strapped and treble riveted. Plates lie up metal to metal before being riveted and the rivets are driven hydraulically. The boilers are arranged for burning oil fuel and are operated under a system of forced draft supplied by a direct connected turbine fan blower. An Eckliff boiler circulator is installed.

The condenser is of the surface circular steel plate type, having approximately 2,000 square feet of cooling surface. The tubes are of brass, ⅝-inch outside diameter, tinned inside and out, with a pitch of 1 inch. The circulating pump is of the centrifugal type with an 8-inch discharge pipe and two independent 8-inch suctions from the sea. The pump is direct connected with an 8 x 8-inch vertical engine, both mounted on a common bedplate, and arranged to discharge through the condenser or overboard. This pump is fitted as a wrecking pump. The general service pump is 18 x 18 x 12 inches. The tugs are lighted by electricity generated by two 10-kilowatt, 110-volt, direct connected, turbine-driven generators. Both tugs were delivered safely at Colon and are the most powerful in service in the canal zone.

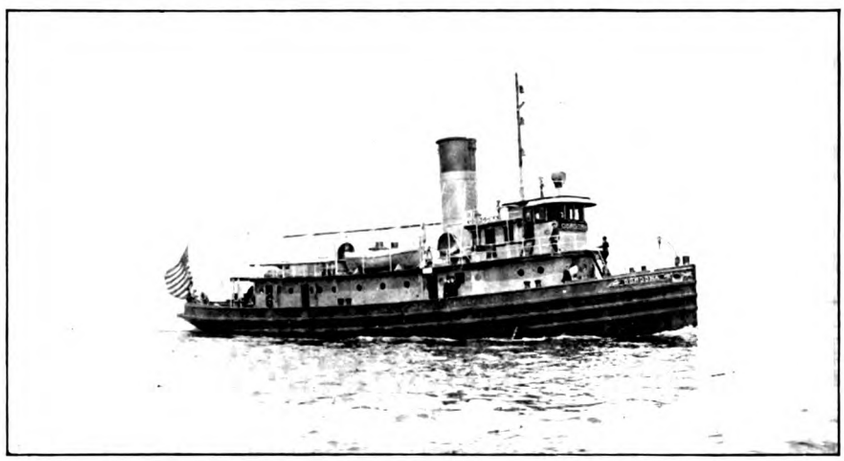

FIG. 2—PANAMA TUG GORGONA BUILT IN THE UNITED STATES

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What the Government is Doing

Rulings of Bureau of Navigation **Custom House Regulations**

Hints to Navigators

Tow Hawsers Are to Stay Same Length

A REPORT on the subject of limiting the lengths of hawsers between towing vessels and sea-going barges in tow has been made by the board authorized for that purpose by an act of congress approved May 28, 1908. This report, dated May 12, 1915, is signed by George Uhler, supervising inspector general; G. R. Putnam, commissioner of lighthouses, and E. T. Chamberlain, commissioner of navigation. The report recommends that no change be made in the existing regulations relating to this subject. The report in full is as follows:

"In accordance with the provisions of the act of congress approved May 28, 1908, and pursuant with instructions dated Dec. 16, 1914, the commissioner of lighthouses, the supervising inspector general of the steamboat inspection service, and the commissioner of navigation, convened in the office of the secretary of commerce at 10 a. m., Dec. 16, 1914, as a board to 'prepare regulations limiting the length of hawsers between towing vessels and sea-going barges in tow and the length of such tows within any of the inland waters of the United States designated and defined from time to time pursuant to section 2 of the act approved Feb. 19, 1895'.

Problem Reviewed at Hearing

"The purpose of the meeting was the consideration of the various letters and appeals from the different interests involved addressed from time to time to the secretary of commerce and suggesting changes and modifications of the present regulations, and referring specifically to Nantucket Shoals as a locality where the regulations are particularly hard to meet, and where a strict compliance with the regulations invites disaster and possible loss of life. There were present at the meeting the secretary of commerce and the assistant secretary of commerce, both of whom took an active part in the proceedings and who evinced a lively interest in the testimony of the various witnesses, and whose pertinent questions and inquiries were of substantial and gratifying assistance to the board in its consideration of a most important matter.

Tow Boat Men Want More Leeway

"Fourteen witnesses representing the towing interests, and consisting of the owners, agents, and actual masters of towing boats, were examined and were given the widest latitude in the explanation of their contentions and protests, all of whom expressed themselves as being perfectly satisfied with the opportunities afforded them to fully and definitely state their case. None of the representatives of the various steamship companies navigating the waters in question nor any of the masters of the steamships were present, their opinions, observations and suggestions being in the form of letters received after the adjournment of the meeting. The opinions of the masters of the lighthouse tenders in that district have also been received, and have been carefully considered.

"The masters of the towing boats agree almost unanimously that they should not be restricted or hampered in any way in the handling of their tows by any regulations, but that it should be left entirely to the judgment and discretion of the master when or where to shorten or lengthen his hawsers, and that the state of the sea and weather should determine his action at all times.

"Some of the masters of the towing steamers testified that a compliance with the regulations was impossible, and this in the face of an acknowledgment that they had never tried it, and that they knew of no master that had tried it and failed, and so far as the statements of these gentlemen are concerned, they fail utterly to sustain the contention that the regulations should be modified. On the other hand, we have the statements of the masters of the steamships and lighthouse tenders familiar with the conditions of navigation, and who realize the possiblities of collision due to the extraordinary and dangerous length of tows in tortuous channels and congested waters, and whose interest in the safe navigation of their vessels and the safety of life give their expressions and suggestions the strength of reason and the force of truth.

"The present regulations were adopted after careful review and upon the conclusion that their application would entail but little delay and a minimum of inconvenience, having in view the purpose of the legislation, and were approved with a full understanding of their force and effect. They are neither drastic nor distressing, and can be met by all whose concern for safety of life and property should be paramount at all times, but are no doubt annoying to those who cannot or will not realize the presence of other vessels which may be seriously inconvenienced or dangerously crowded by the maneuvers of long tows, especially in thick weather.

"The steamship men and the officers of the lighthouse tenders appreciate the value of the protection afforded by the present regulations and suggest that no modification is necessary. The board fails to appreciate the necessity for any change or modification of the present regulations and has the honor to so report."

Only One Certificate Required

Hereafter the local inspectors of steamboats will issue only one certificate of inspection to each steamer and that will go to the master or owner direct. The steamboat inspection service has issued the following circular on the subject:

"On and after the receipt of this circular letter by local inspectors, steamboat inspection service, the original annual certificate of inspection issued by them to any domestic steam or motor vessel, to any domestic sea-going barge of 100 gross tons or over, or to any inspected foreign passenger steam vessel, shall be issued by them

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direct to the master or owner of the vessel to which it relates.

"The original certificate of inspection delivered to the master or owner of any such vessel of over 25 gross tons shall be placed by such master or owner in a conspicuous place in the vessel, where it will be most likely to be observed by passengers and others, and there kept at all times. On any such vessel of not over 25 tons the original certificate of inspection shall be kept on board to be shown on demand.

"In forwarding the original certificate of inspection direct to the master or owner of a vessel for the first time, local inspectors shall notify the master or owner that only the original copy of the certificate of inspection furnished him is required to be posted or kept on board, as the case may be, under the act of congress approved March 4, 1915.

"One certified copy of the certificate of inspection shall be delivered to the collector or other chief officer of customs of the district in which such inspection has been made, who shall keep the same on file in his office.

"One copy of the certificate of inspection in full shall be kept in the vessel file in the inspectors' office."

Inspection Service Rulings

The steamboat inspection service, bureau of navigation, department of commerce, Washington, D. C., has recently handed down the following rulings relative to the transportation of certain commodities on passenger steamers:

Under date of May 4, 1915, file No. 68490/2, the bureau informed the Atlas Supply Co., Manayunk, Philadelphia, Pa., that waterproof linoleum cement, as per the sample submitted by that firm having a flash and fire point of 59 degrees Fahr., shall not be transported on steamers carrying passengers.

Under date of May 12, 1915, file No. 70078/1, the bureau informed Benham & Boyesen, 21 State street, New York, N. Y., that liquid raw carbolic acid may be carried as a deck load on steamers carrying passengers in unlimited quantities, providing it is packed, according to the quantity, in iron drums or in water-tight tin cans which are inclosed in strong wooden cases, and that naphthalin crudum and naphthalin sublimatum may be transported on steamers carrying passengers when packed in strong wooden barrels or casks.

Under date of May 27, 1915, file No. 44240, the bureau informed the Blaugas Co. of America, 25 Madison avenue, New York, N. Y., that the transportation of blaugas on steamers carrying passengers is not prohibited by section 4472 of the revised statutes, provided it is transported in cylinders that comply in all respects with the regulations prescribed by the interstate commerce commission for the transportation of such articles by rail.

Should Signal Arrival

Executive Order No. 1990, dated July 9, 1914, as amended by Executive Order No. 2073 of Nov. 4, 1914, provides in part with reference to ships approaching the Canal Zone as follows:

"ART. 40.—As soon as radio communication can be established with the Canal, vessels should report their names, nationality, length, draft, tonnage, whether or not they desire to pass through the Canal, require coal, provisions, supplies, repairs, to go alongside of a wharf, the use of tugs, probable time of arrival, length of stay in port, or any other matters of importance interest. If this information has been previously communicated through agents or otherwise to the Captain of the Port it will not be necessary to report by radio, but the probable time of ship's arrival should always be sent promptly.

"ART. 49.—No radio tolls, either coast station or forwarding, will be imposed against ships on radiograms transmitted by ships on Canal business. There will be no charge made against the Panama Canal Zone land lines or radio stations for the transmission of radiograms to ships on Canal business.

"The Naval Radio Service will claim no charges from ships on messages sent by masters of vessels to any government official in the Canal Zone, which messages contain information set forth in Article 40. Such messages will be treated as Canal business. In order to facilitate accounting it is requested that such messages be checked "CB," thereby indicating that the messages are sent on Canal business."

The United States coast and geodetic survey, department of commerce, Washington, has issued a new inside route pilot book covering the coast of New Jersey from Sandy Hook to Cape May. It is particularly designed for small craft navigating the inside coastal waters. In addition to a general description of the through route with directions for navigating it, information is included in relation to port facilities, and places where supplies and different kinds of fuel may be had.

Vessels Warned of Ice

Details of the International Ice Observation and Patrol Service

FOR the purpose of carrying on the international ice observation and ice patrol service provided for by the International Convention for the Safety of Life at Sea, London, 1913-14, the U. S. Coast Guard Cutters SENECA and MIAMI have been detailed for this service.

The object of the ice patrol service is to locate the icebergs and field ice nearest to the trans-Atlantic steamship lane. It will be the duty of patrol vessels to determine the southerly, easterly, and westerly limits of the ice, and to keep in touch with these fields as they move to the southward, in order that radio messages may be sent ou daily, giving the whereabouts of the ice, particularly the ice that may be in the immediate vicinity of the regular trans-Atlantic steamer lane.

The MIAMI on April 16 relieved the SENECA, which had been performing ice observation and ice patrol service since Feb. 15, 1915, and during the months of April, May and June, and as much longer as necessary, these two vessels will alternate on patrol, making alternate cruises of about 15 days in the ice region; the 15 days to be exclusive of time occupied in going to and from Halifax. The movements of the vessels will be so regulated that on the fifteenth day after reaching the ice region the vessel on patrol will be relieved by the second vessel if possible, at which time the first vessel will proceed to Halifax, replenish her coal supply, and return in time to relieve the other vessel at the end of the latter's 15-day cruise. It is important that the patrol be continuous, and the vessel on patrol will not leave her station until relieved by the other vessel unless it is absolutely necessary to do so.

Having located the ice, the patrol vessel will send the following daily radiograms. All times in radiograms will be in the seventy-fifth meridian time. At 6:00 p. m. (seventy-fifth meridian time) ice information will be sent broadcast for the benefit of vessels using 600-meter wave length. This message will be sent three times with an interval of two minutes between each. At 6:15 p. m. (seventy-fifth meridian time) the same information will be sent broadcast three times in a similar

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manner, using 300-meter wave length. At 4:00 a. m. (seventy-fifth meridian time) a radiogram will be sent to the Branch Hydrographic Office, New York City, through the nearest land radio stations, defining the ice danger zone, its southern limits, or other definite ice news. The telegraphic address of the Branch Hydrographic Office is "Hydrographic, New York". Ice information will be given at any time to any ship with which the patrol vessel can communicate.

Ice information will be given in as plain concise English as practicable, and will state in the following order: (a) Ice (berg or field); (b) date; (c) time (seventy-fifth meridian time); (d) latitude; (e) longitude, and (f) other data as may be necessary. While on this duty, the patrol vessel will endeavor by means of daily radio messages to keep ships at sea advised of the limits of the ice fields, etc.

The radio calls of the patrol vessels are as follows:

Name of ship.	Call letters.	Power in kilowatts.	Wave length in meters.
Miami	N R Q	2	300-600-725
Seneca	N R E	2	300-600-750

The radio messages from the patrol ships will be given publicity immediately upon their receipt by the Branch Hydrographic Office, New York, and by the Hydrographic Office, Washington, D. C.

Bids Asked For New Surveying Vessel

PLANS and specification of a new surveying vessel for the United States coast and gedetic survey will be sent out to prospective bidders on July 1, 1915. This new vessel will be named SURVEYOR and will be used in surveying and charting the coasts and waters of Alaska.

SURVEYOR will be a two-deck single-screw steel steamer with a triple expansion engine and two Scotch boilers using crude oil as fuel. She will have a flush deck with high bulwarks forward and aft and a wooden deck house extending three-quarters of her length amidship. She will be protected by a double bottom which will extend the full length of the engine and boiler space and join watertight compartments forward and aft. Her bow will be of the pilot boat type and her stern will have considerable overhang to facilitate sounding operations. Her smoke stack and two pole masts will be raked aft in harmony with the character of her bow and stern and her general appearance will be that of a staunch ocean-going vessel.

The principal dimensions and features of SURVEYOR will be as follows:

Length, over all, feet	186
Length, on water line, feet	160
Depth, feet	20½
Beam, feet	34
Draft (loaded), feet	11½
Gross tonnage (estimated), tons	800
Displacement (loaded), tons	1,000
Horsepower (indicated)	1,000
Propeller (diameter), feet	10½
Working pressure (main boilers), lbs.	190
Revolutions (average)	110
Maximum speed (estimated), knots	12
Fuel capacity (crude oil), tons	230
Steaming radius (estimated), miles	8,000
Accommodations for officers, including captain	11
Accommodations for petty officers	14
Accommodations for crew	42
Feed water (tanks), gallons	20,000
Store room capacity, cubic feet	10,000
Steam launches (28 feet)	2
Power whaleboats (24 feet)	2
Whaleboat (28 feet)	1
Cutter (28 feet)	1
Small boats	4
Electric lighting and power, kilowatts.	25
Refrigerating plant (capacity), tons	2
Wireless equipment (sending), miles	300

In order to simplify the work of ship builders in preparing bids for this vessel and to reduce uncertainties tending to increase the amount of proposals, the specifications will call only for construction of hull, machinery and such equipment as are common to first-class merchant marine vessels of similar type. All remaining parts and equipment of special design, or peculiar to surveying vessels in general, will be obtained or constructed under separate specifications, bids to be submitted at a later date. This will not prevent the successful bidder for construction of the hull and machinery from bidding on the additional parts and equipment and their installation at the time of the submittal of the additional plans and specifications.

According to present plans, the additional parts and equipment to be secured by the government under separate bids are as follows: Sounding machines and surveying equipment; steam launches; power and other boats; compasses and navigating instruments; special davits for large steam launches; wireless instruments and equipment; refrigerating machinery; sails, awnings, leather cloths, etc.; boatswain stores, hawsers, etc.; fire hose, fire extinguishers, life preservers, etc.; gun mounts, rifles, etc.; carpenter tools, engineer taps, dies, drills, files, etc.; furniture, tables, chairs, etc., not built-in vessel; upholstery, mattresses, bed springs, curtains, linen, etc.; galley and mess outfits, china, cutlery, silverware, etc.; electric hoisting winch for steam launches, located in winch room, and tackles, oars, sails, etc., for boats and power launches.

Further to emphasize the fact that the hull and machinery of SURVEYOR will be substantially the same in design and material as that of merchant vessels of similar dimensions and power, the material and structural requirements of the vessel will be entirely governed by the rules of the United States steamboat inspection service and by "Rules for the construction and classification of steel seagoing vessels" of the American bureau of shipping. The main engine, boilers, auxiliary machinery and any fittings of stock design fulfilling the requirements of first-class standard merchant marine practice, it is stated, will be accepted if substantially complying with the requirements of the plans and specifications.

Following the custom of the merchant marine, the representatives of the United States coast and geodetic survey designated to look after the construction of SURVEYOR will be her prospective commanding officer and chief engineer.

For information of those interested, it can be stated that the allotment of funds for the construction of SURVEYOR called for by the specifications to be submitted July 1, 1915, has been fixed at a sum not to exceed $190,000. The allotment of funds for parts and equipment to be secured by the government under separate specifications at a later date has been estimated and fixed at $30,000. This gives a total of $220,000 available for the complete construction and equipment of SURVEYOR.

Lake Erie Ore Receipts

Out of a total of 5,012,359 gross tons of iron ore shipped down the Great Lakes during May, 3,629,570 tons went to Lake Erie ports, distributed as follows:

Port.	May, 1915.
Buffalo	366,123
Erie	23,797
Conneaut	1,147,972
Ashtabula	614,981
Fairport	249,965
Cleveland	588,168
Lorain	411,736
Huron	71,233
Sandusky	.....
Toledo	66,752
Detroit	88,843
Total	3,629,570

W. R. Haynie, manager of the United States office of The Bolinders Co., located at 30 Church street, New York, has issued an instructive bulletin describing the Bolinders direct reversible marine oil engine. The engine is a 2-cycle, hot bulb type, running on heavy crude or residue fuel oil as well as kerosene. The bulletin gives a complete description of the engine and will be sent to anyone upon request. A number of these engines running from 80 to 640 B. H. P. have been installed on vessels.

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Foreign Ships Now Fly Our Flag

List of Foreign Vessels Admitted to American Registry Between Oct. 20, 1914 and May 29, 1915, Under the Act of Aug. 18, 1914

Ref. Rig. No.	Name of vessel.	Gross tons.	Home port.	Owner.	Former Owner.	Former Nationality.
Sch.	W. H. Baxter	399	Gulfport, Miss.	J. C. Peterson	T. C. Thomson	British
Bkn.	Stranger	622	Mobile, Ala.	Edward L. Whitney	Lester C. Bodden	British
St. s.	Robert Dollar	5,356	S. Francisco, Cal.	Dollar S. S. Line	Dollar S. S. Lines, Ltd	British
St. s.	Steaua Romana*	5,275	Philadelphia, Pa.	Union Petroleum S. S. Co.	Steaua Romana	Roumanian
Bkn.	St. Paul	471	Mobile, Ala.	George J. Santa Cruz	T. C. Thomson	British
St. s. (1)	Cushing	6,894	New York N. Y.	Standard Oil Co	Deutsch - Americanische Petroleum Gesellschaft	German
St. s.	Colusa	5,732	S. Francisco, Cal.	W. R. Grace & Co	New York & Pacific S. S. Co., Ltd.	British
St. s. (2)	Oregon	727	New York, N. Y.	Andrew Olsen	Aktieselskabet Dampskibet Oregon	Norwegian
St. s.	Cacique	6,202	New York, N. Y.	W. R. Grace & Co	New York & Pacific S. S. Co., Ltd.	British
Ship	Vincent	1,904	Portland, Me.	New England Ship Co	Charles Edgar Kelley	British
St. s. (3)	Mundale	3,285	New York, N. Y.	Munson Steamship Line	Crossbun Steamship Co., Ltd	British
Ship	*Dunsyre	2,149	S. Francisco, Cal.	Eschen & Minor	Victoria Shipping Co., Ltd	British
St. s. (4)	Baton Rouge	4,973	New York, N. Y.	Standard Oil Co	Deutsch - Americanische Petroleum Gesellschaft	German
St. s. (5)	Bayway	5,084	New York, N. Y.	Standard Oil Co	Deutsch' - Americanische Petroleum Gesellschaft	German
Sch.	Delta	317	Gulfport, Miss.	A. F. Dantzler	J. W. Baxter	British
St. s. (6)	Petrolite*	3,710	New York, N. Y.	Standard Oil Co	Deutsch - Americanische Petroleum Gesellschaft	German
St. s. (7)	Corning*	5,073	New York, N. Y.	Standard Oil Co	Deutsch - Americanische Petroleum Gesellschaft	German
Ship	Poltalloch	2,253	S. Francisco, Cal.	Eschen & Minor	Ship Poltalloch Co., Ltd	British
Ship	*British Yeoman	1,953	S. Francisco, Cal.	Eschen & Minor	British Yeoman Ship Co., Ltd	British
St. s. (8)	Gargoyle	4,433	New York, N. Y.	Vacuum Oil Co	Pure Oil Co	German
Bark	Edna M. Smith	816	Mobile, Ala.	Alfred L. Staples	Arthur Gray	British
St. s. (9)	Princeton	5,081	New York, N. Y.	Standard Oil Co	Deutsch - Americanische Petroleum Gesellschaft	German
St. s. (10)	Somerset	5,079	New York, N. Y.	Standard Oil Co	Deutsch - Americanische Petroleum Gesellschaft	German
St. s. (11)	Maracas	2,925	New York, N. Y.	N. Y. Transatlantic S. S. Co.	Trinidad Ship'g & Trading Co., Ltd.	British
St. s. (12)	Georgiana	4,596	Savannah, Ga.	Walker & Armstrong	Union Navigation Co., Ltd	British
St. s. (13)	Caddo*	6,330	New York, N. Y.	Standard Oil Co	International Petroleum Co	British
St. s.	*Satsuma	4,204	New York, N. Y.	Barber & Co	Oriental S. S. Co., Ltd	British
Bkn.	Lovisa	939	New York, N. Y.	George Taber Hay	Frederick Carleton Lockhart	British
St. s. (14)	De Soto	6,268	New York, N. Y.	Standard Oil Co	Deutsch - Americanische Petroleum Gesellschaft	German
St. s. (15)	Neptune	1,352	New York, N. Y.	Morse Dry Dock & Repair Co.	F. Alessi	Uruguayan
St. s. (16)	Bayamo	3,296	New York, N. Y.	N. Y. & Cuba Mail S. S. Co.	Compania Cubana de Navegacion	Cuban
St. s.	Dacia	3,544	Marquette, Mich.	Edward N. Breitung	Hamburg-American Line	German
St. s.	Chincha	6,395	New York, N. Y.	W. R. Grace & Co	New York & Pacific S. S. Co., Ltd.	British
St. s. (17)	Southerner	4,170	Savannah, Ga.	Walker, Armstrong & Co	Union Navigation Co., Ltd	British
St. s. (18)	M. S. Dollar	4,216	S. Francisco, Cal.	Dollar S. S. Line	Dollar S. S. Lines, Ltd	British
St. s. (19)	Colon	1,530	San Diego, Cal.	American Mexican Trading Co.	Compania Naviera del Pacifico S. A.	Mexican
St. s. (20)	Dayton*	5,294	New York, N. Y.	Standard Oil Co	Deutsch - Americanische Petroleum Gesellschaft	German
St. s. (21)	Bradford	6,303	New York, N. Y.	N. Y. & Cuba Mail Co	Deutsch - Americanische Petroleum Gesellschaft	German
St. s. (22)	Santiago	3,490	New York, N. Y.	Union S. S. Co	N. Y. & Cuba Mail Co	Cuban
St. s. (23)	Coalinga	7,318	S. Francisco, Cal.	Union S. S. Co	Pectan S. S. Co	British
St. s. (24)	Moreni	4,045	New York, N. Y.	Standard Oil Co	Deutsch - Americanische Petroleum Gesellschaft	German
St. s. (25)	Pioneer	5,075	New York, N. Y.	Standard Oil Co	Deutsch - Americanische Petroleum Gesellschaft	German
St. s. (26)	California	7,574	S. Francisco, Cal.	John A. Hooper	Algoa S. S. Co	British
St. s. (27)	Polarine	4,046	New York, N. Y.	Standard Oil Co	Deutsch - Americanische Petroleum Gesellschaft	German
St. s. (28)	Camaguey	3,671	New York, N. Y.	N. Y. & Cuba Mail Co	Compania Cubana de Navegacion	Cuban
St. s. (29)	Munwood	3,190	New York, N. Y.	Munson Steamship Line	Crossbun S. S. Co., Ltd	British
St. s. (30)	Suruga	4,374	New York, N. Y.	Barber & Co., Inc	N. Y. & Oriental S. S. Co., Ltd	British
St. s. (31)	Antilla	3,652	New York, N. Y.	N. Y. & Cuba Mail Co	Compania Cubana de Navegacion	Cuban
St. s. (32)	Balboa	615	S. Francisco, Cal.	American-Mexican S. S. Co	Balboa S. S. Co	Mexican
St. s. (33)	Guantanamo	3,292	New York, N. Y.	N. Y. & Cuba Mail Co	Compania Cubana de Navegacion	Cuban
Bark (34)	Belmont	1,528	Boston, Mass.	Hall Shipping Co	Belmont Shipping Co	British
St. s. (35)	Evangeline	4,360	Boston, Mass.	Evangeline Co., Inc	Canada, Atlantic & Plant S. S. Co., Ltd	British
St. s. (36)	Benito Juatez	476	San Diego, Cal.	American-Mexican S. S. Co	Compania Naviera del Pacifico, S. A.	Mexican
St. s. (37)	Sonora	449	San Diego, Cal.	American-Mexican S. S. Co	Compania Naviera del Pacifico, S. A.	Mexican
St. s. (38)	Ardmore	7,129	New York, N. Y.	Standard Oil Co	Deutsch - Americanische Petroleum Gesellschaft	German
St. y. (39)	Owera	426	Providence, R. I.	Peter G. Gerry	Peter G. Gerry	British
Sch. (40)	Gypsum Empress	779	Mobile, Ala.	Cowles Ship Supply Co	James E. Scott	British
St. s. (41)	Muskogee	7,224	New York, N. Y.	Standard Oil Co	Deutsch - Americanische Petroleum Gesellschaft	German
Ship	Golden Gate	2,040	S. Francisco, Cal.	James Rolph, Jr	Augustus P. Rolph	British
St. s. (42)	Mexicano	2,265	New York, N. Y.	Pierce Oil Corporation	Compania de Navegacion Pierce, S. A.	Mexican
St. s. (43)	Housatonic	3,143	New York, N. Y.	Housatonic S. S. Co., Inc	Hamburg-American Line	German
St. y. (44)	Agawa	602	New York, N. Y.	Charles W. Harkness	Charles W. Harkness	British
Bark (45)	Ruth Stark	1,057	Boston, Mass.	Peter H. Crowell	Revere Company, Ltd	British
St. s. (46)	Matinicock	6,766	New York, N. Y.	Standard Oil Co	Deutsch - Americanische Petroleum Gesellschaft	German
St. s. (47)	Standard	10,073	New York, N. Y.	Standard Oil Co	Deutsch - Americanische Petroleum Gesellschaft	German
St. y.	Surf	397	New York, N. Y.	John H. Hanan	John H. Hanan	British
St. s. (49)	Atlantic Sun	2,334	Philadelphia, Pa.	Sun Co.	Soc ete Anon d'Entreposage & de Transp.	British
Bkn. (48)	Hildegard	622	Mobile, Ala.	George J. Santa Cruz	j	Norwegian

*Consular certificate.

Total to May 29, 1915, 147 vessels, 518,358 gross tons.

(For Vessels Registered Previous to Oct. 20, 1914, see *The Marine Review*, December, 1914, page 466.)

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Lighter Built From Special Design

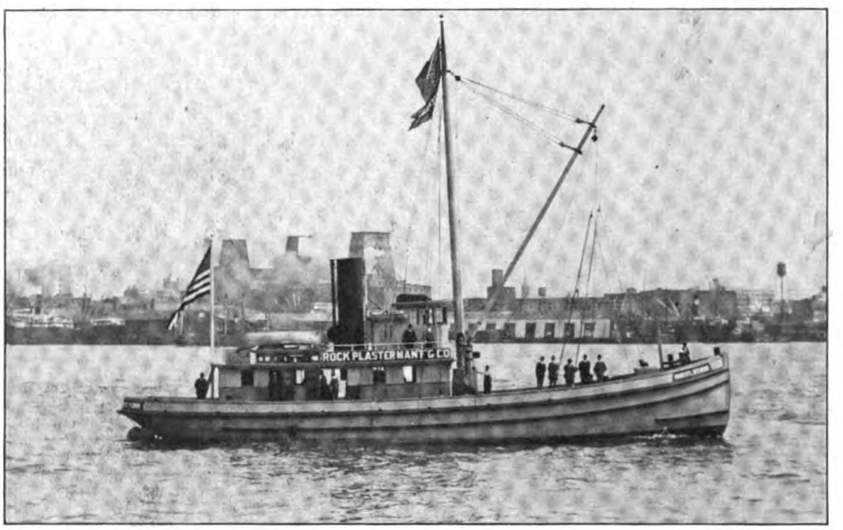
Description of a New Steamer Constructed to Architect's Specifications For Service in New York Harbor

THE steam lighter ROBERT L. STEVENS recently was delivered by the builders, Verdon & Co., Staten Island, N. Y., to the Rock Plaster Mfg. Co., New York. The boat was built from designs of Cox & Stevens, naval architects, New York.

The Rock Plaster company has a fleet of several lighters. Its decision to have the new boat built from designs furnished by a naval architect, is indicative of the growing tendency to employ expert advice in new construction. The saving secured in vessel operation by scientific design and proper balance of all engineering features, is being more widely recognized and their influence upon the cost of operation is being more carefully investigated. ROBERT L. STEVENS is designed to carry practically all of her cargo on deck and consequently maximum deck space was desirable. The machinery, deck house and derrick mast, therefore, have been kept as far aft as possible, as shown in the accompanying illustration. The lines of the vessel were designed so that she will trim properly when light or loaded. The dimensions are:

Length over all, feet	97
Beam, molded, feet	28.6
Depth of hold, feet	10
Draught, feet	9.6

The lighter will carry at least 160 tons without overloading, an unusually large capacity for a vessel of her dimensions. In constructing the hull, an effort was made to secure a high grade of material and workmanship. The keel, stem and stern post are heavy white oak scantlings. The timbers also are white oak, double-sawed and closely spaced, giving a very rigid construction.



THE STEAM LIGHTER ROBERT L. STEVENS

The garboard and shear strakes and wales are 4-inch white oak. The planking used elsewhere is 3 inches in thickness, all being square fastened with iron spikes and locust treenails. All clamps, shelves and keelsons are heavy yellow pine in long lengths, securely scarfed and fastened. The hanging and lodge knees are hackmatack. The deck is 3-inch yellow pine and the log waist and covering board is white oak. The lighter has exceptionally heavy wearing strakes of white oak which are heavily ironed. A complete equipment of chocks, bitts and cleats is provided so that the vessel also can be used for towing. The derrick mast and boom are placed just forward of the house and are designed to handle five-ton weights. The coal bunkers are abreast the boiler on each side and are of large capacity. The water tanks are carried partly in the afterhold and partly in the forehold. The fore peak is fitted up as a forecastle, this arrangement providing additional space in the forehold for carrying cargo. The galley and mess-

(*Continued on page* 254.)

Explanation of Reference Numbers

The explanation of the reference numbers in the table of foreign-built vessels admitted to American registry, which appears on the opposite page, is as follows: (1) Formerly German S. S. PROMETHEUS. (2) Formerly Norwegian S. S. SAMA. (3) Formerly British S. S. LURISTAN. (4) Formerly German S. S. OSAGE. (5) Formerly German S. S. MOHAWK. (6) Formerly German S. S. EXCELSIOR. (7) Formerly German S. S. MOHICAN. (8) Formerly German S. S. PENNOIL. (9) Formerly German S. S. SIOUX. (10) Formerly German S. S. TECUMSEH. (11) Formerly British S. S. CARMARTHENSHIRE. (12) Formerly British S. S. HARFLEUR. (13) Formerly *a*, German S. S. ADORNA; *b*, Canadian S. S. WINNIPEG. (14) Formerly German S. S. PHOEBUS. (15) Formerly British S. S. NORWICH, and later EVELYN. (16) Formerly British S. S. TURKISTAN. (17) Formerly British S. S. HARLEY. (18) Formerly *a*, British S. S. STANLEY DOLLAR; *b*, British S. S. ARAB. (19) Formerly *a*, German S. S. ERNA; *b*, Dutch S. S. KONIGEN WILHELMINA; *c*, Mexican S. S. RAMON CORRAL. (20) Formerly German S. S. HARPORT. (21) Formerly German S. S. HESPERAS. (22) Formerly *a*, British S. S. TUBARISTON; *b*, Cuban S. S. SANTIAGO. (23) Formerly British S. S. PECTAN. (24) Formerly German S. S. MEPPEN. (25) Formerly German S. S. KIOWA. (26) Formerly British S. S. ALGOA. (27) Formerly German S. S. EMS. (28) Formerly Cuban S. S. CAMAGUEY. (29) Formerly British S. S. MUNWOOD. (30) Formerly British S. S. SURUG. (31) Formerly *a*, British S. S. LURISTAN; *b*, Cuban S. S. ANTILLA. (32) Formerly Mexican S. S. MANUEL HERREERIAS. (33) Formerly *a*, British S. S. REGISTAN; *b*, Cuban S. S. GUANTANAMO. (34) Formerly British Bark BELMONT. (35) Formerly British S. S. EVANGELINE. (36) Formerly Mexican S. S. BENITO JUAREZ. (37) Formerly Mexican S. S. SONORA. (38) Formerly German S. S. DELPHIN. (39) Formerly British Yct. O-WE-RA. (40) Formerly British Sch. GYPSUM EMPRESS. (41) Formerly German S. S. TRITON. (42) Formerly *a*, British S. S. HARRY WADSWORTH; *b*, British S. S. HENRY RIETH; *c*, Mexican S. S. MEXICAN. (43) Formerly *a*, German S. S. PICKHUBEN; *b*, German S. S. GEORGIA. (44) Formerly British S. Y. AGAWA. (45) Formerly *a*, British Bark MARIE; *b*, British Bark RAKAIA. (46) Formerly German S. S. LEDA. (47) Formerly German S. S. JUPITER. (48) Formerly Norwegian Bark HENNY. (49) Formerly British S. S. IRIS.

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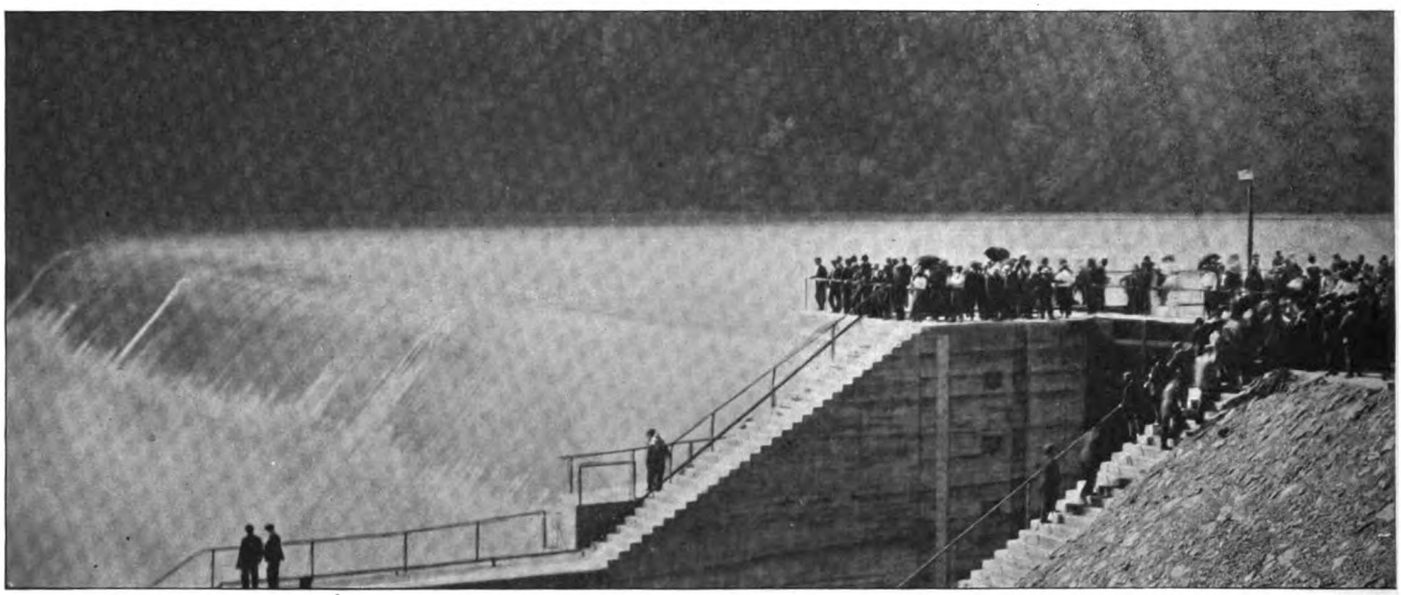
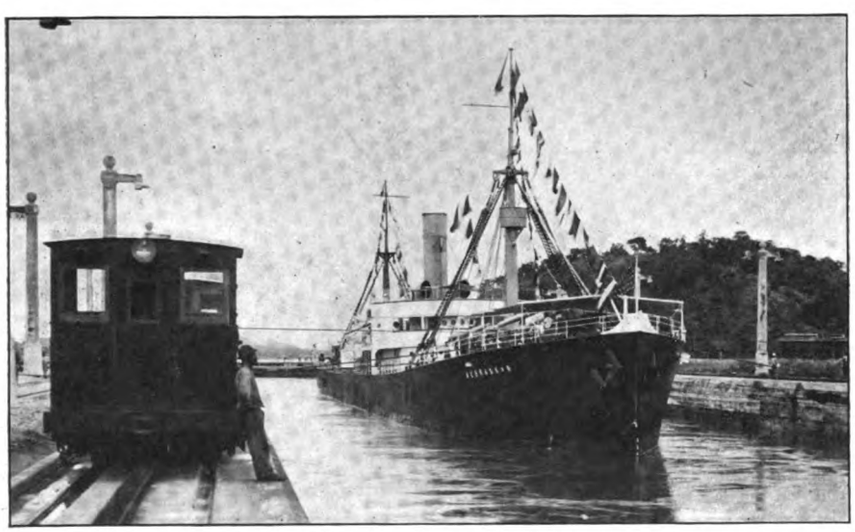


FORMAL OPENING OF ALABAMA'S NEW $15,000,000 WATERWAY

With the opening of the gates in Lock No. 17 on the Black Warrior river, Alabama, an all-year, 6-foot waterway is provided

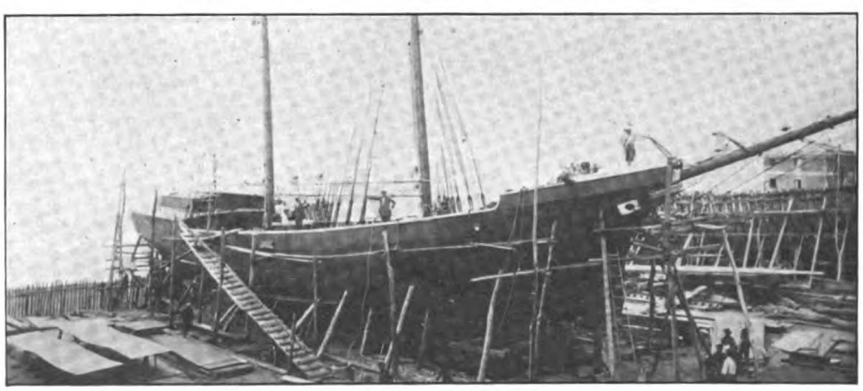


THE NEBRASKAN IN THE PANAMA CANAL

The American steamer Nebraskan was damaged by a torpedo on May 25 while enroute to the United States. See article on page 234 of this issue

SPONSOR AT LAUNCHING OF U. S. S. JACOB JONES

See article on page 258



POWER SCHOONER COMMERCIO DE ESQUINA

This boat was recently completed at the Cantiere Navale di Chiavari yards near Genoa, Italy, for service on the La Plata, South America. She is 90 feet long and 23 feet beam

OLD CANAL BOAT AT CINCINNATI

The old time canal boat is doomed, but canal traffic is by no means decadent

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Latest Marine News in Pictures

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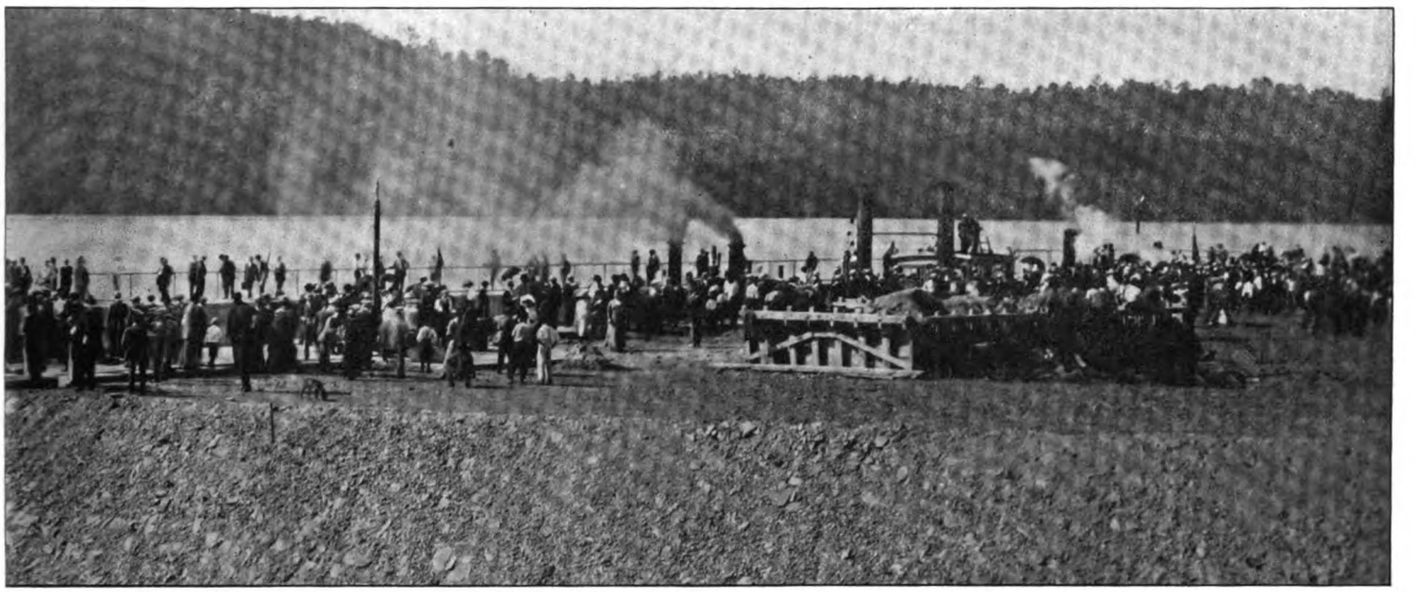
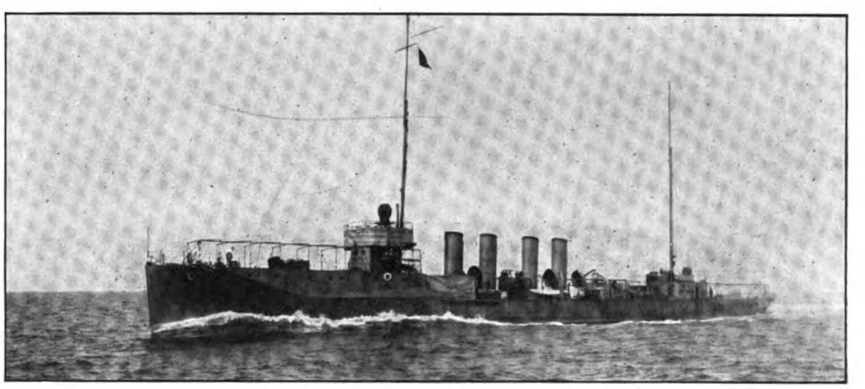


WHICH WILL EVENTUALLY CONNECT BIRMINGHAM WITH THE SEA

from the Cordova coal fields to Mobile, a distance of 450 miles. Lock No. 17 is said to be the highest two-lift lock in the world.

PICKET BOAT FOR ITALIAN NAVY

A steel armored boat equipped with a 100-horsepower Kind diesel type motor used by the Italian navy for scouting and patroling. These little boats are expected to be of material assistance in the Italian campaign against the Austrians



LATEST ADDITION TO UNCLE SAM'S NAVY

U. S. Torpedo-Boat Destroyer Ericsson, built by the New York Shipbuilding Co., Camden, N. J., steaming 30.41 knots per hour on her trial trip thus exceeding her guaranteed speed by 1.41 knots. Note absence of smoke

ON THE DECK OF A POLAR TRADER

AN OLD SEA DOG—ONE OF THE TRADER'S CREW

Labrador depends entirely on the sea for its communications with the outside world and for the trade in this far northern region a special type of vessel, combining steam with sail, has been developed

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Why All the Ship Yards Are Busy

An Analysis of the Factors Underlying the Present Unprecedented Revival in American Ship Building—Prosperity Will Extend Over Period of Years

By C. J. Stark

WITH the largest volume of new construction in the history of modern shipbuilding in this country now under way among the yards along the Atlantic and Pacific seaboards, a notable period in the creation of outright American tonnage for the ocean trade is in progress. Prosperity so long denied coast shipbuilders has burst upon them on a scale completely exceeding the most optimistic expectations and with such abruptness as to render the present capacity quite inadequate to meet the demand. From Newport News to Bath, and from Los Angeles to Seattle practically every berth is filled with a new bottom in some stage of construction, while many more craft are under contract and await their turn on the blocks. Since Dec. 1, it is ascertained by carefully compiled records, no less than 35 new merchant vessels of good size have been awarded to the Atlantic yards alone aggregating approximately 200,000 gross tons. Each week has been bringing additions to this lengthening list. This unprecedented number of ships added to work laid down before December, taken in conjunction with a quite pretentious naval program for the for the government and to the usual amount of small and miscellaneous work, presents a situation that is without parallel in this country since the coast yards were established on their present basis. A number of the Atlantic coast yards now have their capacity engaged for 15 to 18 months in the future, some of them for longer periods. In addition a considerable number of new construction propositions are before the builders for bids. In fact, it is learned that some of the largest projects in new construction that yet have arisen in the present revival, in some cases entailing fleets of boats, remain to be decided and the chances for their ultimate maturity are said to be very bright. So heavily engaged is the capacity of the eastern yards, that the Clyde Steamship Co., in order to get much desired deliveries, recently was obliged to place a contract for three 2,500-ton boats for ocean trade with the Great Lakes Engineering Works, Detroit. The tax upon shipbuilding capacity is resulting in plans now being carried out for the enlargement of the construction facilities of various eastern yards. The Maryland Steel Co. at Sparrow's Point has combined two smaller ways to give it increased ability for building large-sized vessels. The Harlan & Hollingsworth Corporation at Wilmington, Del., has extended its capacity and the Fore River Shipbuilding Co., Quincy, Mass., is planning important enlargements. The smaller companies also have felt the general betterment in shipping and in many cases are improving their plants. Several new shipbuilding projects are the normal result of the present activity. Most of the business

(*Continued on page 254*)

TABLE SHOWING A PORTION OF THE NEW CONSTRUCTION UNDER WAY AT ATLANTIC COAST YARDS

This Table is Offered Merely For Its Suggestive Value. No Special Effort Has Been Made to Make it Complete

Name or Yard No.	Type and Owners.	Dimensions, ft. in. ft. in. ft. in.	Approx. gross, tons.
	New York Shipbuilding Co., Camden, N. J.		
Oklahoma	U. S. Battleship, U. S. Govt.....	595 0 x 95 0 x 44 6	27,500*
Idaho	U. S. Battleship, U. S. Govt.....	600 0 x 97 0 x 46 3	32,000*
Melville	U. S. Destroyer Tend., U. S. Gvt.	400 0 x 54 3 x 36 6	4,670
Ericsson	U. S. Torpedo Boat Destroyer, United States Government.....	300 0 x 30 6 x 17 0	1,090*
Jacob Jones.....	U. S. Torpedo Boat Destroyer, United States Government.....	310 0 x 29 10 x 17 7	1,150*
Wainwright	U. S. Torpedo Boat Destroyer, United States Government.....	310 0 x 29 10 x 17 7	1,150*
Franklin	Collier, Coastwise Transp. Co....	377 4 x 55 0 x 34 5	5,600
Plymouth	Collier, Coastwise Transp. Co....	377 4 x 55 0 x 34 5	5,600
Yard No. 163...	Dipper Dredge, Bucyrus Co., for Panama Canal	144 0 x 55 0 x 15 0	1,550
Yard No. 164...	Collier, Coastwise Transp. Co....	319 0 x 49 3 x 27 6	3,420
Yard No. 165...	Collier, Coastwise Transp. Co....	319 0 x 49 3 x 27 6	3,420
Yard No. 166...	Collier, Coastwise Transp. Co....	319 0 x 49 3 x 27 6	3,420
Yard No. 167...	Bulk Oil Steamer, Standard Oil Co. of New York.....	468 0 x 62 6 x 39 6	10,250
Yard No. 168...	Bulk Oil Steamer, Standard Oil Co. of New York.....	468 0 x 62 2 x 39 6	10,250
Bristol	Collier, Coastwise Transp. Co....	360 0 x 49 0 x 30 0	4,015
Yard No. 170...	Bulk Oil Steamer, Petroleum Transport Co.	468 0 x 62 6 x 39 6	10,250
Yard No. 171...	Crane Pontoon, Wellman-Seaver-Morgan Co., for Norfolk Navy Yard	140 0 x 85 0 x 15 0	1,650
	Staten Island Ship Building Co., New York.		
Yard No. 643...	Steel Tug, Panama Canal.....	125 6 x 30 0 x 17 0	351
Yard No. 644...	Steel Tug, Panama Canal.....	125 6 x 30 0 x 17 0	351
Yard No. 646...	Steel Steam Lighter, Erie R. R. Co.	80 0 x 20 0 x 9 0	100
Yard No. 650...	Steel Tug, C. R. R. of N. J.....	98 0 x 24 0 x 12 7	170
Yard No. 651...	Steel Tug, Huasteca Petroleum Co., Inc.	112 0 x 24 6 x 14 0	215
Yard No. 664...	Steel Barge, Huasteca Petroleum Co., Inc.	225 0 x 34 0 x 12 0	1,861
Yard No. 674...	Steel Tug, B. & O. R. R. Co....	118 0 x 25 0 x 13 6	217
Yard No. 675...	Steel Tug, Magnolia Petrol'm Co.	100 0 x 24 0 x 12 9	171
....	18 Wooden Barges.....	———	...
	Harlan & Hollingsworth Corporation, Wilmington, Del.		
....	Single Screw Steamer, Shell Co., of Cal.	427 0 x 53 1 x 31 0	5,800
....	Oil Tank Steamer, Shell Co. of Cal.	427 0 x 53 1 x 31 0	5,800
....	Oil Tank Steamer, Shell Co. of Cal.	427 0 x 53 1 x 31 0	5,800
....	Oil Tank Steamer, Petroleum Transport Co.	404 0 x 51 0 x 30 2	5,000
....	Twin Screw Ferry Steamer, Riverside & Fort Lee Ferry Co...	200 0 x 40 0 x 16 8	1,400
	Baltimore Dry Docks & Ship Building Co., Baltimore, Md.		
San Pablo.....	Sea-going Suction Dredge, U. S. Engineers Dept.	155 0 x 35 0 x 17 0	.....
Hull No. 72....	Oil Barge, Huasteca Petrol'm Co.	206 0 x 30 0 x 11 6	720
Hull No. 73....	Oil Barge, Huasteca Petrol'm Co.	128 0 x 30 0 x 11 6	450
	Sawyer Bros., Milbridge, Me.		
....	Schooner	———	70
....	Schooner	———	200
	G. G. Deering Co., Bath, Me.		
....	Five Masted Schooner.....	———	1,700

*Displacement.

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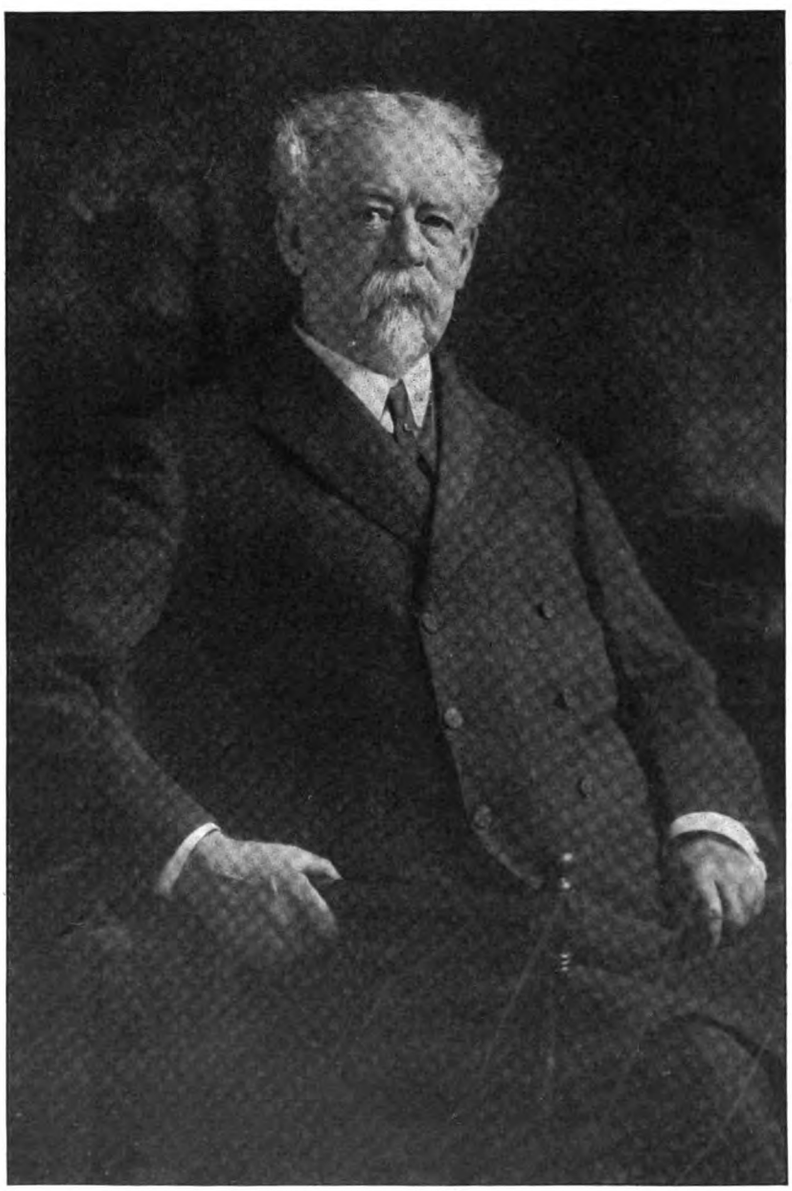
Death of Russel Widely Mourned

A Review of the Career of George H. Russel, One of the Country's Leading Men of Affairs

By Ralph D. Williams

IN THE death of George H. Russel which occurred at his home on May 17, Detroit lost one of its most noted citizens. There was scarcely an industry into which his activity did not enter. He was primarily a manufacturer, though for the past 25 years he had given his personal attention to banking. He had been in the harness, one might say, since boyhood, when he entered the employ of the Gaylord Iron Co. at the age of 16 years. Later he became yard foreman of the Detroit & Lake Superior Iron Manufacturing Co. and in 1868 was made secretary and treasurer of the Detroit Car Works and Hamatramck Iron Works. In conjunction with his brother, Walter S. Russell, he organized the Russell Wheel & Foundry Co. in 1878, becoming its president. Through this connection he came into touch with the railway interests throughout the United States. It was in 1889 that he directed his attention to banking, being elected president of the State Savings Bank. When the State Savings Bank was consolidated with the Peoples Savings Bank, Mr. Russel was chosen to act as president. He was instrumental in founding the Great Lakes Engineering Works of Detroit, of which he was vice president at the time of his death. He was a director of the Union Trust Co. of Detroit and of the American Car & Foundry Co. of New York. In 1898 he was elected president of the American Bankers' Association. There was scarcely an industry in Detroit with which Mr. Russell was not associated in one way or another. He might be said to have been steeped in constructive work almost from the first. His father, George B. Russel, was one of the most farsighted and progressive of men. He had established a shipyard at Hamatramck in 1854 and had conceived the idea of a carrier exclusively for the bulk freight trade. Accordingly be built the propeller B. L. Webb in 1856, designed with special reference for carrying ore. This was the year after the canal at Sault Ste. Marie had been opened to commerce and revealed Russel's wonderful perspective powers. Unfortunately Webb was burned on her first trip to Lake Superior in November, 1856, so that she never had an opportunity to demonstrate her usefulness. George B. Russel was also instrumental in founding the American sleeping car system with George M. Pullman and together they established a plant in Detroit for this purpose. It can therefore be seen that George H. Russel inherited his manufacturing proclivities. It was not, however, as a manufacturer or banker that George H. Russel was most admired, but rather as a man. Tall, distinguished looking and affable there was much of the prince about him. His courtesy was unfailing and there was a charm about his personality that it is almost impossible to put into words. No situation was ever so trying as to ruffle his composure. He was invariably serenity itself, but to see him at his best was to meet him in social intercourse. As a host he was unrivaled and as an after-dinner speaker few had his equal. In wit and repartee his mind in its nimbleness resembled that of the great Dr. Samuel Johnson and it is well within the truth to say that Detroit will not look upon his like again. Mr. Russel leaves a widow and three children. The directors of the Peoples State Bank caused to be inscribed upon their books the record of his inestimable loss.



GEORGE H. RUSSEL

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Why Ship Yards Are Busy

(*Continued from page 252.*)

placed in the east has been well distributed among the prominent builders. The complete list shows an award of eight to the Newport News Shipbuilding & Dry Dock Co., including two ships for the Crowell & Thurlow Steamship Co., three tankers for the Standard Oil Co., and one vessel each for the Luckenbach Steamship Co., the New York & Porto Rican Steamship Co., and the Mallory Steamship Co.; seven ships have been placed with the Maryland Steel Co., including three for the American Hawaiian Steamship Co., three for the A. H. Bull Steamship Co. and one for the Munson Steamship Co., nine have been ordered from the New York Shipbuilding Co., including five ships for the Coastwise Steamship Co., two tankers for the Standard Oil Co., one for the Petroleum Transport Co. and one for the Huasteca Oil Co.; four ships will be built by Wm. Cramp & Sons Ship & Engine Building Co., including one tanker for the Huasteca Oil Co., two passenger and freight ships for the Mexican Navigation Co., and one for W. R. Grace & Co.; four ships are being constructed by the Harlan & Hollingsworth Corporation, including three tankers for the Anglo-Saxon Petroleum Co. and one for the Mexican Petroleum Co.; and three ships are under way at the plant of the Fore River Shipbuilding Corporation, including two tankers for the Texas Co. and one for the Cuban Distilling Co.

These vessels range from about 3,500 to 11,000 gross tonnage each. The largest are the tank steamships for the Standard Oil Co. In type, the tank freighters predominate as of the total of 35, the number of craft of this description is 15. Practically all of the vessels now under construction or contract, are intended ostensibly for coastwise trade but some of them undoubtedly will find their way into the overseas commerce.

Two Influences at Work

Two separate and wholly distinct factors have been influential in bringing about the present state of activity in the eastern shipbuilding industry. One, obviously, has been the great European war and the results direct and indirect which have flowed from it. The other has been the stimulus exerted by the Panama canal in opening new trade routes and extending old ones with the west coast of South America, with Hawaii and with the Pacific ports of the United States. It is very likely that a considerable part of the present demand for new boats would have appeared had there been no great European conflict to completely transform the position and activities of the dominent shipping nations. There has been evidence during the past year or two that the building of the shorter waterway between the oceans would increase the needs for coastwise tonnage. But the fact remains that the greatest impetus in this movement has been gained from the consequences of the European war.

High Transatlantic Freight

It is significant that all the boats now being built are designed especially for the coastwise trade. Some of these will be required to fill the gaps caused by the withdrawal of some American boats from the coastwise trade to take part in the very profitable freight market on transatlantic service. These high rates have been due both to the enormous export movement from this country to Europe and to the reduced supply of foreign ships, notably German and British, resulting from capture, internment or sinking. Today freight rates to the British Isles, to Mediterranean and other European ports are four to five times the normal figure with prospects of continuing so as long as the war lasts. The American-Hawaiian Steamship Co. has put some of its boats in the transatlantic trade, as have other lines.

War Not a Factor

It is to be noted, nevertheless, that many of these boats would have been ordered regardless of the war. The Anglo-Saxon Petroleum Co., a British Corporation, placed its three tank boats with an American yard to gain American registry in order to engage in the coastwise commerce and the war had nothing to do with these boats. The Standard Oil Co. boats, undoubtedly, will be used for both coastwise and overseas carrying. At least two of the new boats, one for the American-Hawaiian Steamship Co. and one for the Mallory line will replace vessels recently lost. Besides the Anglo-Saxon Petroleum Co., other foreign interests have inquired for vessels in this country, including Italy, which asks three boats, and Spain. This action, apparently, has followed from the limited building capacity now available abroad, due to Germany's isolation and to the fact that British shipyards are so much occupied with orders from the admiralty and with replacing bottoms lost as the result of German attacks.

With work ahead for one to two years and good immediate prospects for further contracts, eastern ship builders in no way are concerned regarding the early future and expect the present demand to increase rather than to slacken as governed by the extent construction capacity available. Some speculation naturally is being indulged in as to whether the present prosperity will survive after the war. The conviction is pretty general however, that the revival of American ship building has come to stay.

It is felt that the American public has been impressed quite generally by the present war of the folly of this country's relying on foreign bottoms to carry its export trade and that efforts to realize on the extraordinary opportunities that now are qpened to extend foreign commerce are only half-complete unless they include adequate provision for protected transportation. Some effective measure it is believed, will grow out of the various plans now being agitated for the restoration of the American merchant marine. The interesting theory is advanced in some quarters that the present excess cost of construction and operation which has been the effective bar against American ships in competition with foreign, will be more equalized after the war, by wages, construction cost, etc., being raised in a greater measure abroad than in this country and that some form of government aid will cover whatever disadvantage of this character that still might remain. Furthermore, it is believed, the steady expansion of the coastwise trade and of commerce with south and central American countries, stimulated by the Panama canal, will exercise a vital influence in maintaining a large demand for American ships as well as for American cargoes.

Steam Lighter

(*Continued from page 249.*)

room are in the deck house immediately aft of the machinery enclosure. The captain's stateroom is placed just aft of the pilot house with which it communicates.

The boiler is of the leg type, 9 feet in diameter and 13 feet in length. It was built by Heipershausen Bros., New York. The engine is 18-inch diameter and 24-inch stroke. The propeller is cast iron, 7 feet eight inches in diameter and 10-foot pitch. To economize the over-all length, a disc type of thrust bearing has been installed.

The lighter carries a complete equipment of pumps. The hoisting engine is of the Lidgerwood type, double cylinder, single drum.

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Making Photographs Under Water

An Account of a Remarkable Development Employing the Cooper-Hewitt Lamp Making Possible Accurate Examination of Submerged Wrecks

IN THESE days of daring exploits when the engines of destruction that operate under water are the cause of so much comment, it is particularly pleasing to turn to an equally remarkable but far more humane development of science, one that seems destined to play an important part in maritime affairs — submarine photography. It includes the taking of pictures of both stationary and moving objects under water. The actual taking of the photographs is not so difficult, the main requisite being to get beneath the water, to remain there in comfort, and be able to perform the work.

This work is made possible by an invention of Charles Williamson and his two sons, of Norfolk, Va., which consists of a collapsible accordion-like submarine tube of waterproof canvas and rubber, three feet in diameter, braced at regular intervals by iron rings. This construction, as indicated in Fig. 1, permits the passage of a person down the tube, and its flexibility permits it to be dragged along by a vessel. The top of the tube remains open at the deck, and the lower end expands into a chamber about 5 feet in diameter, one side of which is provided with an observation glass window through which the pictures are taken. The space in the chamber is sufficient to permit two men, one to operate the camera, and one to control the movement of the tube which is effected by chains operated from the deck of the boat. Fresh air is provided by a simple device, enabling the operators to work in comfort.

How the Illumination Problem was Solved

In order to accomplish submarine photography, however, it was necessary to secure some efficient means of artificial illumination which could be easily handled, would furnish the desired light, and not be prohibitive in cost. After trying other types with varying success, the Cooper-Hewitt quartz lamp, illustrated in Fig. 4, was adopted. A battery of nine of these lamps, each having 2,400 candlepower, was installed. This lamp consists of a short tube of pure fused quartz or silica containing vapor of mercury which is made luminous by the passage through it of an electric current.

The essential parts of the lamp are the quartz burner and an auxiliary device. The former is the light giving tube, its support and enamelled reflector, while the latter consists of the necessary tilting mechanism and coils for starting and maintaining the mercury arc.

In ordinary commercial use, the burner is suspended from the lower part of the auxiliary device and enclosed in a glass globe, but for submarine work, the auxiliary device is kept on board the boat, and the burner with its reflector holder is mounted in a casing that is placed in a frame and lowered into the water. The construction of the lamp and its method of installation are shown in Figs. 1 and 4.

Although scientists abroad

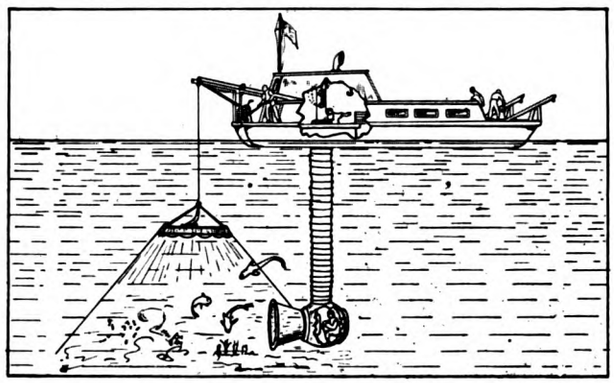

FIG. 1—SKETCH SHOWING CONSTRUCTION AND OPERATION OF WILLIAMSON SUBMARINE PHOTOGRAPHIC APPARATUS

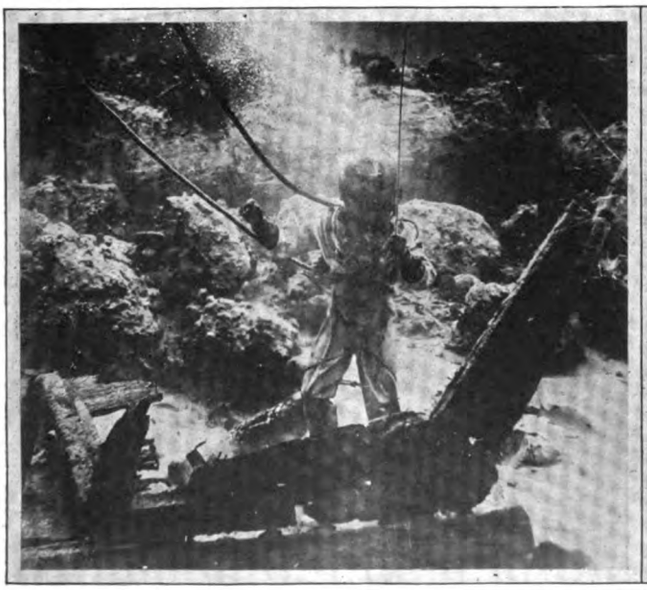

FIG. 2—DIVER PHOTOGRAPHED WHILE EXPLORING WRECK OF A SUNKEN SHIP AIDED BY LIGHT OF COOPER-HEWITT LAMP

FIG. 3—LIFE AND DEATH STRUGGLE UNDER WATER WITH MAN EATING SHARK, WHICH WAS KILLED A FEW SECONDS AFTER PICTURE WAS TAKEN

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have been experimenting with under-sea photography for many years past, an Englishman, Dr. Ward, having photographed objects in a fish pond at a maximum distance of 3 feet through the water, it remained for American inventors, the Williamsons, and an American product, the Cooper-Hewitt lamp, lamp, to successfully solve the problem in a practical manner. Photographs and moving pictures have been made through the water by the method described for a distance of 100 feet, thus making an epoch in photography, and surprising even the most ardent advocate of the scheme.

Fig. 3 was made from one of the most remarkable photographs ever taken, being that of a life and death struggle between one of the Williamsons and a man-eating shark, the latter receiving a death blow a few seconds after the picture was taken. The illustration of the diver exploring an old wreck of a ship, 50 feet away from the camera, indicates one of the numerous practical uses to which this most important development may be put.

The Camden Anchor-Rockland Machine Co., Camden, Me., has been awarded contract for seven supply boats for use in the Coast Guard stations on the Florida coast.

Ferry South Shields

The passenger and vehicular ferryboat in service between North and South Shields, England., is handled by an interesting craft. This vessel, named SOUTH SHIELDS, was built to the requirements of the Tyne Improvement Commission by Wood, Skinner & Co., Ltd., of Newcastle-on-Tyne. Her length between perpendiculars is 110 feet, beam 30 feet, breadth over sponsons 43 feet, and the depth, molded, 11 feet 3 inches. Accommodation is provided for 150 passengers, and the vessel is designed also to carry a total deck load of 75 tons. She is provided with two double-hinged gangway doors on each side, hoisted and lowered by the engine below deck, worked by levers on deck. The after end of the vessel is formed so as to allow of a good speed when going astern and shaped so as to give the best possible maneuvering qualities. She is built with bulb angle frames and the vehicular deck is composed of two thicknesses of wood, the surface being grooved so as to give a good foothold. The deck is supported by center longitudinal bulkhead and stanchions on each side. The wheelhouse, fitted on the top of the deckhouse, is arranged to give the master a commanding view. Steam steering gear is provided in this house. The sponsons are supported by strong brackets the entire length of the ship and there is a wing-wale of American rock elm all round the sponsons to act as a fender. A deckhouse is fitted forward of the engine casing and is arranged as an entrance to cabins and crew's quarters. The machinery, constructed and fitted by Messrs. Baird Bros., of North Shields, consists of twin-screw triple-expansion engines, worked by one engineer, and balanced by weights fitted to the cranks, so that no vibration is felt when the vessel is steaming at full speed. The cylinders are of the following dimensions: 10½ inches x 17 inches and 28 inches, with a stroke of 20 inches. The engines are supplied with steam by two steel cylindrical boilers, 9 feet 6 inches diameter by 10 feet 3 inches long, working at a pressure of 160 pounds per square inch, constructed by T. Eltringham & Co., South Shields.

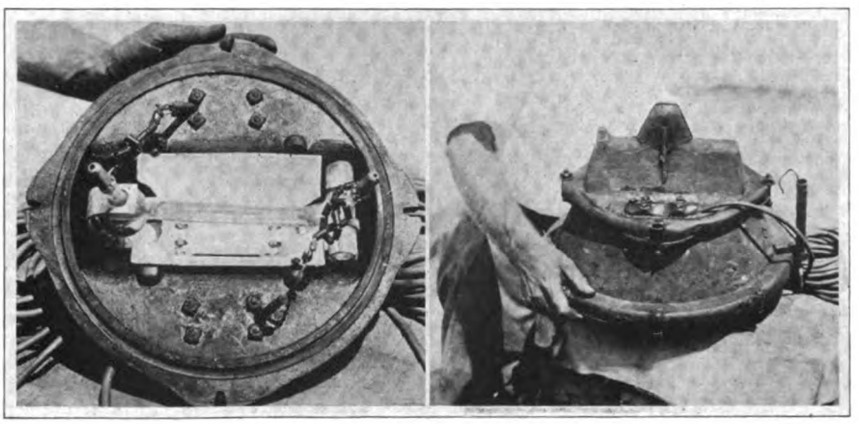
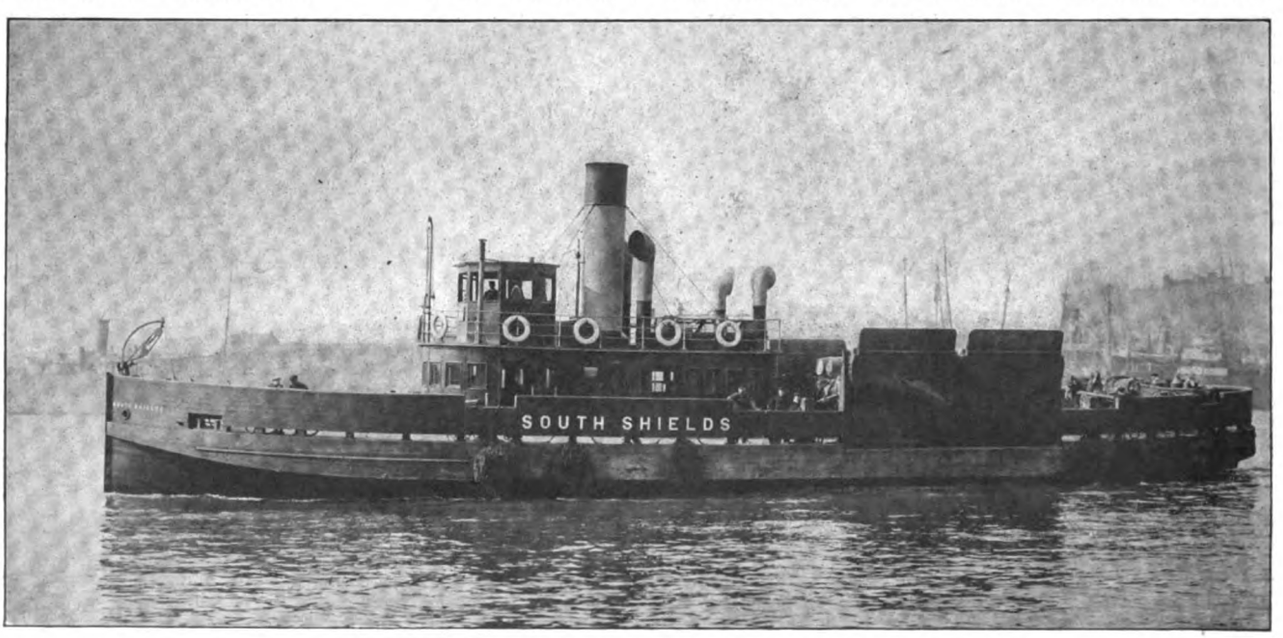


FIG. 4—TOP AND BOTTOM VIEWS OF COOPER-HEWITT LAMP USED IN SUBMARINE PHOTOGRAPHIC WORK



TWIN-SCREW FERRY BOAT FOR THE RIVER TYNE

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Heavy Repairs to a British Tramp

How the Forefoot of Epsom Was Cut Off and Rebuilt at Plant of Seattle Construction and Dry Dock Co.

By Robert C. Hill

WHAT was truly a remarkable piece of repair work has just been completed on the British steamship EPSOM, by the Seattle Construction & Dock Co., Seattle. So seriously damaged in the Straits of Magellan last August that she was at first given up as a total wreck, EPSOM was finally temporarily repaired and made ready for her long voyage north with immense holes in the forward part of her hull sealed by deposits of cement and brick. When she was placed in the Seattle drydock it was found impossible to dislodge this solid mass.

The problem facing the construction company's engineers was a difficult one but they did not hesitate long, for they had contracted to have the vessel in commission in record time. Consequently they decided to amputate the entire forward portion of the hull. For a distance of approximately 75 feet aft of the stem, the entire forward section was cut off, about 15 feet above the keel. This shoe was filled with a solid mass of cement and bricks. It was of no use so the entire piece, weighing about 250 tons was placed on a scow and safely deposited in a deep section of Seattle's harbor.

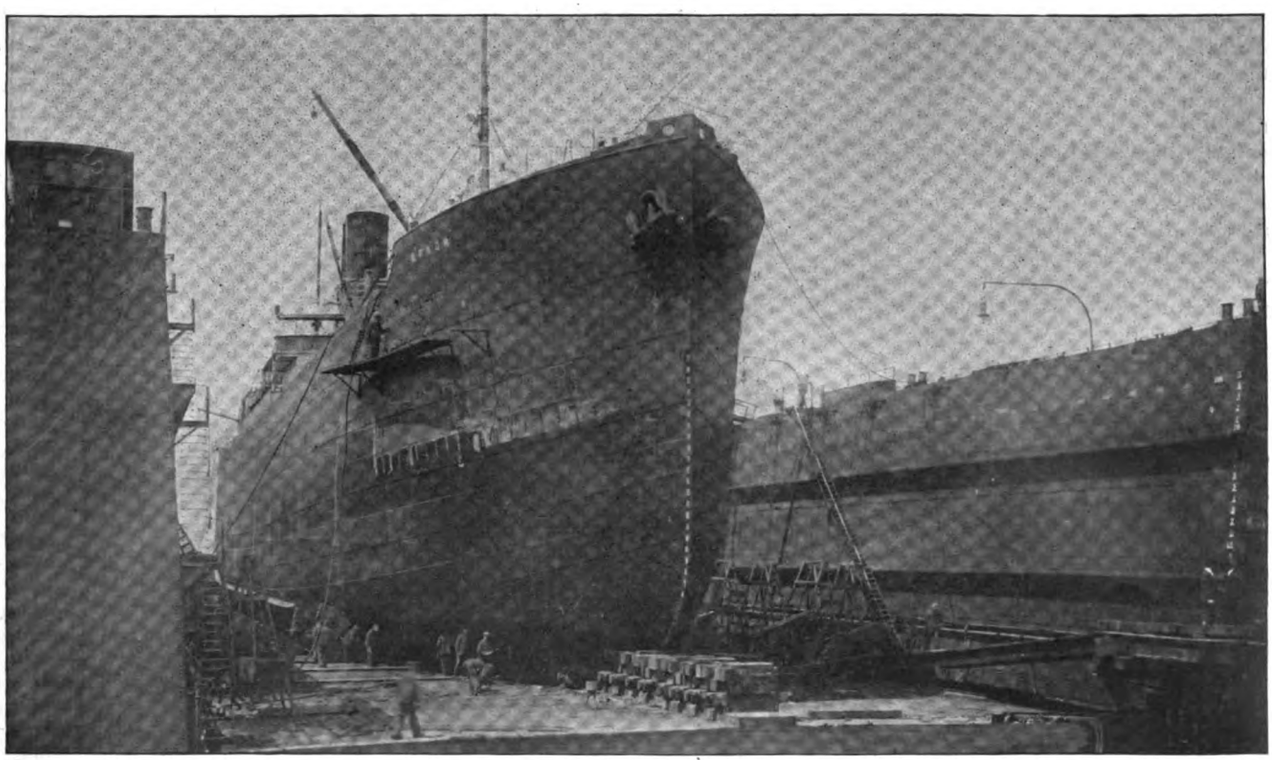
Following the amputation, the contract necessitated rebuilding the entire forward part of the hull and this was accomplished with great dispatch, the large steel plates being fitted in with precision. Thirty-seven shell plates, 17 tank top plates and a large number of frames and considerable flooring were so seriously damaged that they had to be removed entirely and new material substituted.

Job Cost $50,000

Not only was EPSOM completely overhauled and repaired in 21 days, which is thought to be a Pacific coast record for so extensive a contract, but the difficulties imposed by the layer of cement in the forward section added a novelty to the job which has attracted wide attention. The contract called for the completion of the work in 24 days but the local yards turned the vessel back in three days less. It is stated unofficially that this work cost between $40,000 and $50,000. When EPSOM first came to Seattle, her owners intended to make only temporary repairs but the offer of the local company was so attractive that permanent repairs were authorized.

EPSOM is shown in the Seattle drydock in the accompanying illustration. While the new section along the keel does not show, it having been painted before the picture was taken, the extensive work done on the plates higher on the forward bow is plainly indicated.

EPSOM left Sydney, C. B., in June, 1914, with a cargo of rails for British Columbia but in a severe snowstorm early in August she grounded in the straits of Magellan. She lay in the vicinity for about six months. The absence of repair facilities caused great delay and for a time she was believed a total loss. In lieu of better repairs, the expedient of filling the forward portion with cement to seal the openings was adopted and it served fairly well. En route up the Pacific coast she leaked considerably. She put into Coronel, Acapulco and San Francisco and finally made her destination and delivered the cargo. Then she came to Seattle for repairs. As it afterward proved, EPSOM's misfortune was a



EPSOM IN DRY DOCK AFTER REPAIRS WERE COMPLETED

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blessing in disguise for had she not grounded, she would have been captured and probably sunk by the German war vessels which at the time were lying in wait at the west end of the straits. When EPSOM was ready to proceed the German fleet had been sunk and dispersed.

EPSOM is a typical British freighter of 4,556 gross and 2,970 net tons. She was built at Stockton, England, in 1902 and belongs to the fleet of Watts, Watts & Co., London. Her principal dimensions are as follows: Length 377 feet, beam 50.6 feet and depth 19.2 feet. She is now loading wheat at Portland for England at the unusual high rate of 70 shillings per ton.

Jacob Jones

The front cover of *The Marine Review* this month shows the launching of the U. S. S. JACOB JONES at the plant of the New York Shipbuilding Co., Camden, N. J. This vessel is one of the largest destroyers yet launched. Five other similar vessels are under construction, TUCKER, CONYNGHAM, PORTER, WADSWORTH and WAINWRIGHT. It is officially stated by the navy department that these vessels will have the same high sustained sea speed that has proved so successful in previous United States destroyers. They mark a decided advance in radius of action at a high speed over previous designs, and have largely increased offensive power. A number of changes in type and location of fittings have been made to still farther increase the sea-going qualities of these vessels whose prototypes have so successfully proved themselves in the heavy storms on the Atlantic coast. Increased space has been assigned for the living accommodations of both crew and officers, in order to provide all possible facilities and comforts for the personnel, so that they can remain in the highest state of physical efficiency during long cruises or when performing exacting and hazardous duty with the battle fleet.

The main characteristics of these vessels are: Length, 310 feet; beam, 29 feet 10 inches; draft, 9 feet 3 inches, and displacement, 1,090 tons. The battery consists of four 4-inch rapid fire guns and four twin torpedo tubes. The boats are driven by turbines, steam being furnished by oil-burning water tube boilers. The contract price of JACOB JONES was $825,000.

Ore Shipments

Ore shipments on the Great Lakes during May as compiled by *The Iron Trade Review* were 5,012,359 as against 3,852,063 tons for May, 1914, an increase of 1,160,296 tons. The movement to June 1 was 5,516,191 tons as against 4,121,749 tons to June 1, 1914. This is quite an appreciable gain and if the proportion is continued throughout the season, the total movement will be easily in excess of 40,000,000 tons. The movement during May would have been greater than it was were it not for the cut in the rail rate made effective June 15 by the interstate commerce commission. The railways have voluntarily made the rate effective June 1 so that a better movement from the Mesabi range may now be expected.

Following are the shipments by ports with corresponding data for last year:

Port.	May, 1914.	May, 1915.
Escanaba	385,188	479,259
Marquette	121,873	178,927
Ashland	300,928	513,715
Superior	1,673,269	763,889
Duluth	734,090	1,974,321
Two Harbors	636,715	1,102,248
1915 increase		1,160,296
	3,852,063	5,012,359

Port.	To June 1, 1914.	To June 1, 1915.
Escanaba	495,917	528,566
Marquette	121,873	183,365
Ashland	341,766	557,664
Superior	1,735,607	851,064
Duluth	734,090	2,149,310
Two Harbors	692,496	1,246,222
	4,121,749	5,516,191
1915 increase		1,394,442

So far the bulk of the ore has been moved by vessels operated by shippers and wild cargoes have been few. Chartering of outside tonnage will undoubtedly begin during the present month, however, and with fair activity in the iron trade the vessels can expect to enjoy a reasonably active season. The double holiday did not affect the trade at all. There was practically no congestion at Lake Erie ports, all vessels being unloaded promptly.

Richardson Celebrates

Captain W. C. Richardson, of Cleveland, celebrated his seventy-fifth birthday anniversary on June 10. The event was not permitted to go unnoticed by the vessel owners who sent flowers to his office. Captain Richardson intended to take his birthday dinner in the hotel at Unionville, O., with which he has been familiar since boyhood and which has been standing for 125 years. Captain Richardson says that on an average of 25 stage coaches would stop at the hotel for dinner during his boyhood, as this was well in advance of the railroads in that section of the country.

A Good Proposition

VICE PRESIDENT FRANKLIN, of the International Mercantile Marine, New York, proposes a plan for making the American line controlled by that company a real national agency of communication across the sea, with the same kind of help that the Cunard line has received from the British government for its largest and fastest steamships. It is a rather enticing proposition. The four vessels of the American line are not first class in capacity or speed and they will soon need replacing in any case. What Mr. Franklin proposes is that they be replaced with four of the best steamships that can be built for speed and safety on terms similar to those on which the LUSITANIA and MAURETANIA were provided for the English merchant marine and the government mail and subsidiary naval service.

The company agreed to build the two steamships with capital provided by the government, upon which 2¾ per cent interest should be paid for the term of the contract, 20 years from the completion of the vessels. The government was also to pay a subvention for the service of the two vessels for mail carrying, and being fitted for possible naval service, to which they would be liable, amounting to $750,000 a year. This was calculated to be 7½ per cent on the cost of building the ships. That would mean that the subvention alone would yield 4¾ per cent on that cost after the deduction of interest on the money loaned, for construction, and that this income would at the end of the 20-year term have substantially paid the cost of the vessels. In the meantime the company would be presumed to have earned from operation enough in addition to the subvention to make the net profit reasonable for shareholders.

Whether any such scheme could be made available and justified in this country is a question worth considering in connection with building up a merchant marine and strengthening the navy, in view of what has been happening in the last nine months in Europe. Assurance of a first class mail and passenger service with Europe under the American flag has been shown to be a desirable thing, and it may yet appear that a merchant marine capable of being made effectively auxiliary to the navy is important. If the government were to advance capital for construction on a plan of getting it back in service, with a moderate rate of interest for a definite term of years, it would be a matter of equitable calculation to fix the terms on which it should be done. This is one of the problems for shipping men to consider.

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Isherwood System of Construction

In Which the Author Contrasts the Repairs Due to Grounding on an Isherwood Type of Vessel and One of the Ordinary Transverse Type

By Robert Curr

FIG. 1 shows a 6-foot space of a vessel's bottom, 244 feet by 42 feet, 6 inches by 26 feet 6 inches deep, on the Isherwood method.

The bottom plating, B, C and D, are 19 pounds, E and G are 20 pounds, and the keel plate 35 inches by 27.5 pounds per square foot.

The center keelson is 48 inches by 17.5 pounds per square foot, top angles 3 inches by 3 inches by 7.2 pounds, and bottom angles 4 inches by 4 inches by 9.8 pounds per running foot. The longitudinals on the shell plating are of channel 6 inches by 3 inches by 15 pounds per foot, spaced 30 inches apart. In place of longitudinal No. 4 an intercostal girder plate, 12.5 pounds per square foot, with 3-inch by 3-inch by 6.1-pound angles, is fitted between the transverses. On the top seven longitudinals, 6-inch by 3-inch by 11.7-pound angles, are run, which stiffen the tank top plating.

The transverses are 6 feet apart, of 12.5 pounds per square foot plate, with 3-inch by 3 inch by 6.1-pound angles top and bottom, joggled over the plate laps and seam straps. This section, omitting the shell plating, weighs 2,847 pounds.

Fig. 2 shows a 6-foot space of the ordinary type of lake vessel construction. The materials are of the same weight as Fig. 1, excepting the floor and intercostal channels, which are 15 inches by 33 pounds, and the angles to tank top, which are 4 inches by 3 inches by 8.5 pounds. Two girders are fitted, of 12.5-pound plates, from the top of the channel floors with top and bottom angles of 3 inches by 3 inches by 6.1 pounds.

Between the girders and shell plating 15-inch by 33-pound channels are fitted and riveted to the shell plating, girders and floor channels. This section, minus one completed frame, weighs 4,499 pounds.

Fig. 3 shows the Isherwood section with the top part removed, showing the material likely to be affected through grounding.

Fig. 4 shows the cross framed section with only materials likely to be affected under the same cause as Fig. 3.

It will be observed by Fig. 4 that the center keelson, girders and bilge are as likely to be damaged in grounding, as anywhere else, and they are the most expensive parts to repair, while in the Isherwood arrangement, Fig. 3, the parts from the center keelson to the bilge are almost similar.

The girder taking the place of the longitudinal No. 4 in Fig. 3, being intercostal, can be removed easily and with little expense.

Fig. 5 shows an assumed damage on the cross framed vessel on D strake, affecting the channel floors and intercostals and applying the same to the Isherwood section, Fig. 3, two longitudinals and transverses may be bent, as shown by Figs. 6, 7 and 8. The indentation is 3 inches and it is seldom the channels resist fracture under that amount of bending.

Figs. 5a, 5b and 5c show the most economical arrangement for repairing the channel floors when fractured. It requires a 24-inch piece of channel the same as the floor, with 36 rivets 7/8-inch diameter, to make good at each butt. If the channel is not taken out from the center keelson to the bilge it may require two straps. When one strake only is damaged it is very awkward getting out the cross channel.

In the case of the longitudinal frame any length can be removed by simply springing the bottom plating.

Figs. 6a, 6b and 6c show the butt

This is the twenty-fourth of a series of articles on the Isherwood system of construction which began in the September, 1912, issue of *The Marine Review*. The first article dealt with the general specifications of the steamer; the second with the sheer, half-breadth and body plans; third explained the method of getting the sheer; the fourth dealt with the longitudinal and transverse framing; the fifth with offsets; the sixth with the shell plating; the seventh with the shell plating expansion; the eighth with the arrangement of plates and angles forming the spar deck; the ninth with the transverses; the tenth with bulkhead construction; the eleventh with the connection of longitudinal frames to the bulkheads and transverses; the twelfth showed the interior framing between the tank top and spar deck; the thirteenth showed the amount of work that can be put together in a Great Lakes ship yard in a few hours; the fourteenth showed details of riveting in shifts of butts; and fifteenth considered the subject of butt straps and laps; the sixteenth discussed Lloyds rules and their application; the seventeenth showed certain details of the transverse and longitudinal system; the eighteenth gave calculation for the neutral axis and moment of inertia for the transverse framed vessel; the nineteenth showed the materials in the section of the Isherwood vessel; the twentieth showed the arrangement of framing in the engine space extending from frames 24 to 30; the twenty-first showed the bow plating and framing; the twenty-second showed the stern construction abaft No. 30 bulkhead; the twenty-third showed the arrangement of plating on the tank top and expanded plates on the side.

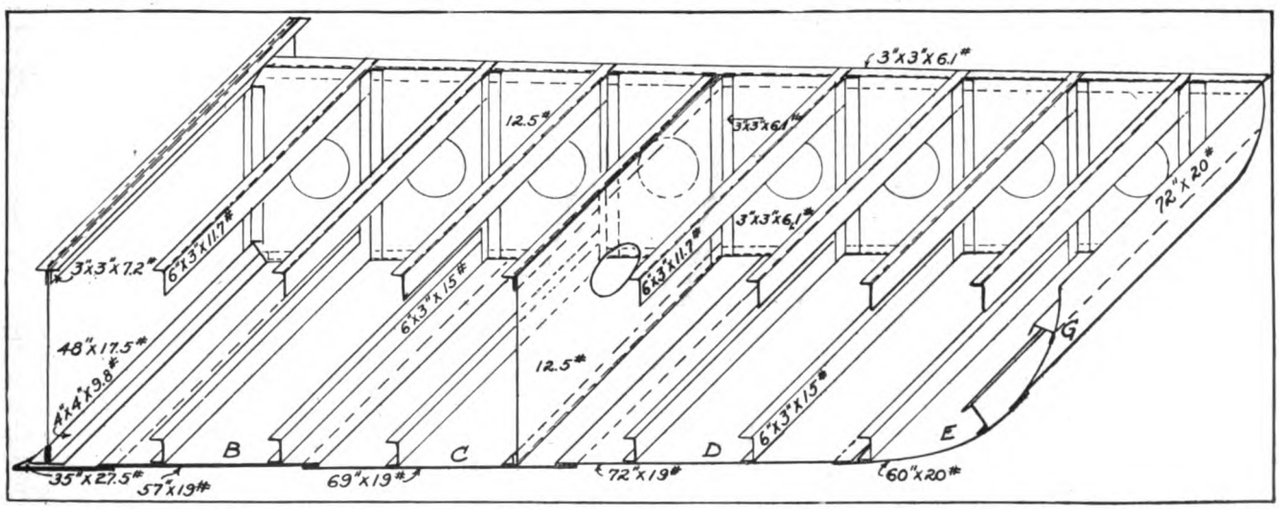

FIG. 1—A PORTION OF A VESSEL'S BOTTOM ACCORDING TO ISHERWOOD METHOD

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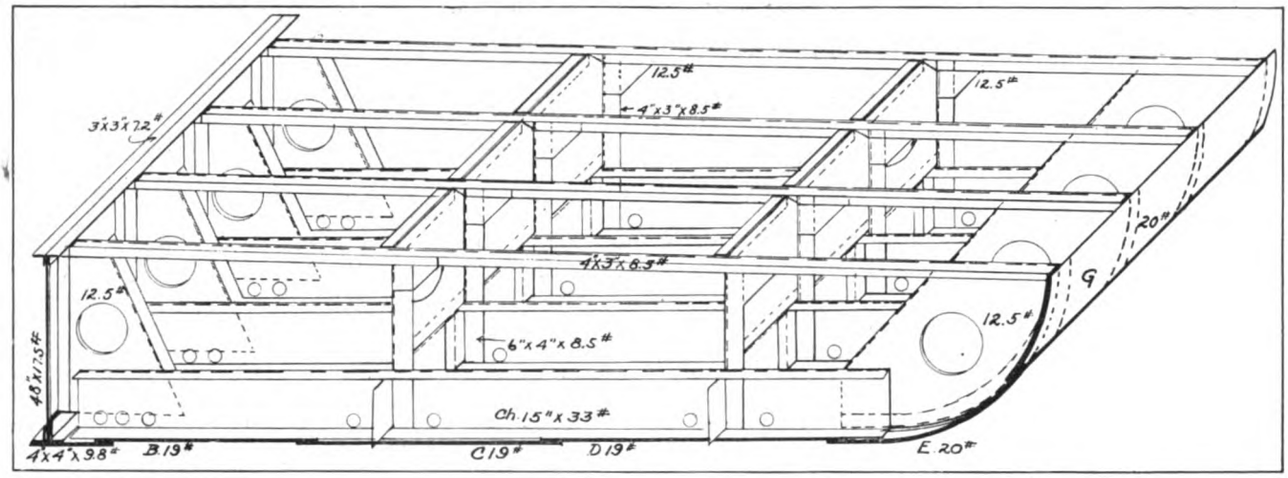

FIG. 2—PORTION OF VESSEL'S BOTTOM OF ORDINARY CONSTRUCTION

strap arrangement on a damaged longitudinal, which only requires 20 rivets ¾-inch diameter.

The longitudinals may be removed, made fair and put back without cutting, but in a case of 10 cross channel floors, 20 butt straps would be required and 360 rivets, as well as the drilling of half the number of rivet holes. It appears that a vessel in grounding does more damage when it strikes the stiffer part of the vessel.

The channel floors, channel intercostals and bulkheads suffer more than a part which will spring, or is more elastic. In this case, it appears very much in favor of the longitudinal framing. The stiff part on the Isherwood system is across the transverse as shown by Fig. 7, and the cutting out for the longitudinal frame leaves a cushion. In grounding probably all that would happen would be the bending of the bottom of the transverse as shown by Fig. 8. This could easily be faired in place or if badly damaged the piece cut off in line with the top of the longitudinal, and a flanged plate lug put on. Comparing the difference in four possible damages by grounding, first consider the cross frame section, Fig. 4, at center omitting center keelson and keel which are similar in both cases. There are two brackets, four angles and two channel floors likely to be damaged in the area of a square foot which weighs 293 pounds. The longitudinal arrangement, Fig. 3, shows the transverse, which is one in three, in the case of the cross framed vessel. There would be two bottom angles, four vertical angles, and transverse plate affected, weighing 108 pounds, and only at every third frame, compared to the ordinary type, which sums up 37 per cent of the cross framed arrangement.

Little Opportunity for Damage

Through the line of girder, Fig. 4, on strakes C and D and omitting the girder plates on the floors there will be two intercostals, one floor and two angles affected, equal to 136.5 pounds. Considering the intercostal girder on Fig. 3 there will be 2 feet of plate, four angles on bottom and vertical angle affected, amounting to 71 pounds, only doing damage to half the amount of material as compared with the construction shown in Fig. 4. Between girders on C and D strakes there is only one channel to contend with, which is 33 pounds per square foot, while in the case of Fig. 3 between two longitudinal frames on the transverse 25 pounds of material would be damaged. Comparing a damage on the lower seam of E strake, Fig. 4, the channel floor, bilge bracket plate and angle would be affected amounting to 209 pounds, while in the same case at the transverse, Fig. 3, only 48 pounds would be affected.

Through the considerable experience gained on the Great Lakes in bottom repairs, estimating the cost can be done fairly accurately; it runs about $4 per square foot.

It might be safe to say that the Isherwood arrangement has at least 50 per cent less material in the interior than the ordinary transverse framing.

Transverse framed vessels in grounding leave the bottom plating corrugated, which appears would be avoided in the longitudinal framing.

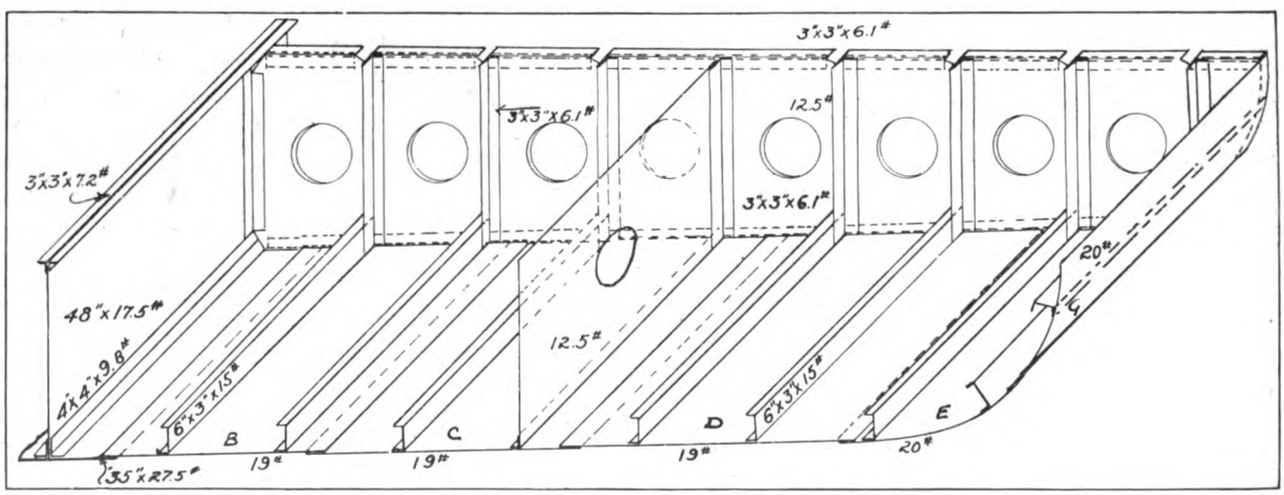

FIG. 3—ISHERWOOD SECTION WITH TOP PART REMOVED

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cent in the value of exports in foreign vessels, the net tonnage of those vessels decreased 19 per cent.

The accompanying table showing the increasing share of our commerce carried in American vessels is particularly interesting in view of the recent announcement that up to May 29 of the current year 147 foreign-built vessels, of 518,358 gross tons, had been registered as vessels of the United States.

New Warehouse at Seattle

The port of Seattle formally opened its Bell street, Class A, reinforced concrete warehouse May 22. A public meeting was held in the spacious roof garden of the structure. Several hundred persons were present and a number of prominent speakers were on the program. It was an ideal day and the roof garden had been beautifully decorated for the event. This part of the structure has been turned over to the Seattle park board for use as an outing place for the public and arrangements will be made for making it most attractive for those who may wish to enjoy an afternoon in the garden, directly overlooking Puget Sound and the Olympic range of mountains. The Bell street warehouse is a part of the Bell street public dock. In addition to being provided with cold storage and dry storage fire-proof space and a connection with the common user railroads on Railroad avenue, the building contains one floor devoted to offices. Part of this will be offered for rental and the balance is already occupied by the port of Seattle commission. These offices are beautifully fitted up and in the center of the space is a special assembly room which will be used for all public gatherings incidental to port work or meetings pertaining to water front operations. The dock was completed last year and now that the warehouse has been finished this complete unit in the port of Seattle's plans for improvement is ready for operation.

Vessels Sell at High Prices

Every existing ship is calculated to become more valuable, as indicated by recent sales. Busy and enterprising owners must buy second hand ships to keep pace with their business requirements, and this they are doing wherever they can obtain them. Values are still rising, and owners who are willing to sell are receiving offers of purchase at advancing prices. People in Sweden are now beginning to complain because so many vessels are being sold abroad. Denmark and Norway, on the other hand, are buying tonnage. Since January, Sweden has sold 24 steamers and four sailing vessels, of about 23,000 gross tons, most of these being acquired by Danish and Norwegian owners. Besides ered, four having disappeared in the North Sea. At least four of the vessels sold flew the Swedish flag, but were owned by British subjects.

LYDGATE, a British, steel, 4-masted bark, 20,350 tons is reported to have changed hands at £12,000 or about $58,300. She carries about 3,850 tons dead weight, was built in 1893 at Newcastle-on-Tyne, and her late owners were the Galgate Co., Ltd., John Joyce & Co., Liverpool, managers. She had a new donkey boiler in 1911.

GRETAVALE, a British, steel steamer, 3,124 tons gross, 2,009 net, built at Greenock in 1905, and owned by A. Crawford, Barr & Co., Glasgow, has been sold to a Swedish firm for $121,000. She is now lying at Gefle and an attempt will be made with the German authorities to get the purchase legalized. If this does not succeed, the steamer will have to lay up in a Swedish port until the end of the war.

CAIRNDON, formerly PHOENIX, a British steel steamer of 2,660 gross and 1,699 net tons, built at Middlebro' in 1893 and owned by the Cairn Line, Newcastle, has been sold to Messrs. J. Cross & Co., Newcastle, England for about $100,000.

Inspection Recommended

Secretary of Commerce Calls Conference of Power Boat Interests to Discuss Proposed Laws

THE inspection of power boats carrying passengers for hire, together with the licensing of the operator in charge, was the subject of a conference of those interested, in the office of Secretary W. C. Redfield, of the department of commerce, June 10. It is the purpose of the department to recommend certain amendments to Sec. 4426, which will bring about the results sought for. Aside from the inspection of the hull and the operating machinery and the licensing of the operator, the department desires authority from Congress to limit the number of passengers which small power boats may carry as it is claimed that these small boats are frequently overcrowded and while it is admitted that few accidents have occurred so far the secretary of commerce expressed a desire to clear his conscience of the casualties of the future.

The inspection of hulls and machinery, so the department states, would be general in nature and not as technical as the inspection for steam vessels. This same opinion was expressed in regard to the examination for operator's license because it is obvious that the navigating limits of small power boats are restricted; they traverse generally only a few miles of waterways which makes navigation with them a simple problem.

It is stated that the proposed amendment would provide a certificate of approval instead of a certificate of inspection. Thus in order to relieve these small boats of a number of requirements of the steamboat inspection laws, they would not be required to carry licensed first and second mates although the license of the operator as well as the certificate of approval would have to be on board at all times.

Secretary Redfield called the conference and invited representatives of power boat interests from various parts of the country to attend. It is claimed that the department has given these proposals careful consideration and the secretary took the stand that the department knew they were necessary. The purpose of the conference therefore was to discuss details and apparently to forestall criticism which might occur at a later date. While no figures were offered showing the number of passenger carrying power boats whose hulls and machinery would have to be inspected, it was agreed in the discussion that an entirely new force of inspectors would have to be hired for the work.

General Uhler stated he had no idea how large a force of power boat inspectors it would require to carry out the provisions of the proposed amendment.

The conference also discussed a new bill proposed by the department for numbering and recording the names and addresses of owners of all power boats of every kind and description which navigate federal waterways. This bill has been proposed by the department because of its inability through collectors of customs and others employed by the department to enforce the present law governing equipment. It is claimed that violators are not apprehended because their boats are not named and fictitious names and addresses of owners

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are furnished the officials. The bill proposes a legible number to be attached to each bow, said number to be recorded in the customs district where the boat is owned, to provide a positive means of identification. It was not made plain how the department would enforce a law requiring numbers when they could not now compel owners of power boats to carry lights, life preservers, etc. If numbers were furnished free by the government an estimated appropriation of $300,000 would be necessary.

While it was not clear how the bill could be enforced it was generally agreed that it would be presented to congress for passage. It would be the opinion of *The Marine Review* representative who attended the conference and listened attentively to the discussion that the numbering bill is theoretical legislation. This cannot be said of the proposed amendment covering inspection of passenger power boats. The latter proposal is practical and can be enforced successfully if the government can afford to hire enough men for the job. It would add greatly to the responsibilities and prerogatives of the steamboat inspection service.

Many German Ships at Italian Ports

COMPLETE and detailed information as to the tonnage, number and identities of German and Austrian merchant vessels which were sheltered at Italian and Italian colonial ports when Italy entered the war on the side of the Allies, compiled from information received at Lloyds (London), and all of which were subject to the reported confiscation decree by the Italian government, is now at hand according to the *Journal of Commerce*. The complete list contains the names of 57 German and Austrian vessels, with a total gross tonnage of 228,761 tons, at 16 Italian ports, which were open to seizure as Italian prizes.

The largest of Italy's prize ships, shown in the list, is MOLTKE, of 12,335 tons gross, held at Genoa after reaching that port from New York on July 28, 1914. Next in size is the German steamer KONIG ALBERT, of 10,484 tons gross, also detained at Genoa after a trip from New York on July 17 of last year.

In the accompanying table is presented the complete and detailed list as compiled by Lloyds, giving the port at which the vessels were sheltered, etc., the names of the ports being given in capital letters.

Complete List of German Ships at Italian Ports

ANCONA.

Lemnos (German steamer), 2,487 tons, Fiume for Hamburg, arrived Ancona about Aug. 4.

BARI.

Deak (Austrian steamer), 2,218 tons, Sunderland for Bari, arrived previous to Oct. 4.

Waltraute (German steamer), 3,818 tons, Baltimore and Brindisi for Tituila, arrived Bari Jan. 29.

CAGLIARI.

Spitzfels (German steamer), 5,809 tons, Hamburg and Rotterdam for Calcutta, arrived Cagliari Aug. 7.

CATANIA.

Lipari (German steamer), 1,539 tons, Genoa for Hamburg, at Catania Oct. 5.

GENOA.

Arciduca Stefano (Austrian steamer), 3,533 tons, Marseilles for Genoa, arrived Aug. 6.

Daska (Austrian steamer), 4,140 tons, Gibraltar for Genoa, arrived Nov. 10.

Dan (Austrian steamer), 4,283 tons, Newport and Malaga for Ancona, arrived Genoa Oct. 10.

Duna (Austrian steamer), 2,899 tons, Fiume for Santos, arrived Genoa Aug. 3.

Francesco Musner (Austrian steamer), 3,225 tons, Taganrog for Genoa, July 30.

Hermersberg (German steamer), 2,824 tons, Sestri Levante for Genoa, arrived Aug. 2.

Konig Albert (German steamer), 10,484 tons, New York for Genoa, arrived July 17.

Maria (Austrian steamer), 3,090 tons, Pointe a Pitre and Marseilles for Genoa, arrived Aug. 3.

Matlekovits (Austrian steamer), 1,905 tons, at Genoa Oct. 30.

Moltke (German steamer), 12,335 tons, New York for Genoa, arrived July 28.

Nimrod (Austrian steamer), 6,968 tons, Tyne for Genoa, arrived Aug. 10.

Prinz Regent Luitpold (German steamer), 6,595 tons, Marseilles for Genoa, arrived July 22.

GIRGENTI.

Imbros (German steamer), 2,380 tons, Hamburg and Rotterdam for Bari, arrived Girgenti Aug. 4.

LEGHORN.

Amalfi (German steamer), 1,756 tons, Termini for Hamburg, arrived Leghorn Aug. 1.

Luzon (Austrian steamer), 4,160 tons, Porto Vecchio for Leghorn, arrived Aug. 30.

Termini (German steamer), 1,523 tons, Hamburg for Mediterranean, arrived Leghorn Aug. 2.

LICATA.

Portofino (German steamer), 1,754 tons, Catania for Licata, arrived previous to Sept. 1.

NAPLES.

Bayern (German steamer), 8,006 tons, Antwerp for Yokohama, arrived Naples March 8.

Marsala (German steamer), 1,753 tons, Genoa for Hamburg, at Naples Oct. 1.

Rhenania (German steamer), 6,455 tons, Kilindini for Hamburg, arrived Naples Aug. 4.

PALERMO.

Algier (German steamer), 3,127 tons, Catania for Palermo, arrived Aug. 1.

Catania (German steamer), 2,996 tons, Genoa for Hamburg, arrived Palermo, Aug. 1.

Tunis (German steamer), 1,833 tons, Nice for Palermo, arrived Aug. 1.

SAVONA.

Bastia (German steamer), 1,527 tons, Bremen for Savona, arrived July 28.

SYRACUSE.

Albany (German steamer), 5,882 tons, Adelaide for Amsterdam, arrived Sept. 2.

Ambria (German steamer), 5,143 tons, New York Hong Kong, arrived Syracuse Sept. 3.

Amrelea (Austrian steamer), 1,346 tons, Las Palmas and Messina for Syracuse, arrived Sept. 19.

Barcelona (German steamer), 5,465 tons, Novorossisk for New York, arrived Sept. 2.

Kattenturm (German steamer), 6,018 tons, Calcutta for Hamburg, arrived Syracuse Sept. 2.

Mudros (German steamer), 3,137 tons, Patoum and Messina for Syracuse, arrived Sept. 3.

Sigmaringen (German steamer), 5,710 tons, Bremen and Rotterdam for East Asia, arrived Syracuse Sept. 3.

Zvir (Austrian steamer), 4,286 tons, Marseilles and Messina for Fiume, arrived Syracuse Sept. 24.

TORRE ANNUNZIATA.

Italia (German steamer), 3,498 tons, Catania for Torre Annunziata, arrived July 28.

VENICE.

Izabran (Austrian steamer), 3,892 tons, Barry for Venice, arrived July 28.

Izgled (Austrian steamer), 4,434 tons, Cardiff for Venice, arrived Aug. 7.

Maria Racich (Austrian steamer), 4,124 tons, Ancona for Venice, arrived Aug. 22.

Olga (Austrian steamer), 3,129 tons, Penarth for Venice, arrived Aug. 9.

Quarnero (Austrian steamer), 3,237 tons, at Venice Dec. 9.

Robinia (Austrian steamer), 2,485 tons, Methil for Venice, arrived July —.

Samos (German steamer), 1,922 tons, Trieste for Venice, arrived Aug. 7.

Volos (German steamer), 1,903 tons, Hamburg, Tyne and Fiume for Venice, arrived July 31.

Italian Colonial Ports

MAGADOXO.

Jozsef Agost Foherczeg (Austrian steamer), 2,680 tons, Sydney for Trieste, arrived Magadoxo ——.

MASSOWAH.

Ambra (Austrian steamer), 5,355 tons, Aden for Massowah, arrived Aug. 8.

Axenfels (German steamer), 4,361 tons, Rangoon for Hamburg, arrived Masowah Aug. 7.

Borkum (German steamer), 5,642 tons, Yokohama for Havre and Hamburg, arrived Massowah Aug. 13.

Choising (German steamer), 1,657 tons, Padang for Massowah, arrived Jan. 13.

Christian X. (German steamer), 4,956 tons, Hamburg and Antwerp for Bussorah, arrived Massowah Aug. 3.

Moravia (Austrian steamer), 3,506 tons, Calcutta for Trieste, arrived Massowah Aug. 14.

Ostmark (German steamer), 4,400 tons, Karachi for Hamburg, arrived Mossowah Aug. 11.

Persepolis (German steamer), 4,566 tons, Antwerp for Bossorah, arrived Mossowah Aug. 4.

Segovia (German steamer), 4,945 tons, Moji for Hamburg, arrived Massowah, Aug. 7.

Sturmfels (German steamer), 5,660 tons, Calcutta for Philadelphia, arrived Massowah Aug. 8.

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Put New Cleveland Dock in Service

The C. & B. Transit Co. and D. & C. Navigation Co. Open New Passenger and Freight Terminals—Traffic Problems Solved by Better Location

By R. V. Sawhill

A STEADILY increasing volume of passenger and freight traffic for several years has kept prominently before the officials of the Cleveland & Buffalo Transit Co., Cleveland, and the Detroit & Cleveland Navigation Co., Detroit, the need for enlarging their terminal facilities at Cleveland. The imperative necessity of providing larger quarters has been met by constructing a new dock at the foot of East Ninth street. The offices and freight shed of the Cleveland & Buffalo line were put in service on June 6. The remainder of the dock will be occupied within a few days.

Four factors largely influenced the decision of the companies to construct a dock upon a new site. These were the narrowness of the Cuyahoga river where the old docks were located, increase in the general traffic on the river, the heavier volume of their own water-borne business, and the lack of facilities for handling freight and passengers to and from the docks conveniently and quickly.

All of these items united in demonstrating that maximum efficiency and economy in handling traffic could not be secured with the old equipment. A rapid survey of the conditions under which the two companies have been operating will demonstrate clearly the force of this statement.

Size of the Dock

Pier is 700 *feet long and* 300 *feet wide.*

More than 5,000 *piles and sheet piles driven for the foundation.*

15,000 *barrels of cement were used.*

12,000 *cubic yards of gravel and crushed stone were used.*

125,000 *feet of wire were required for electrical installation.*

The cast iron mooring posts are built in solid concrete.

For the passenger and office buildings and freight sheds 680,000 *common and pressed brick were required as well as* 500,000 *feet of lumber and* 500 *tons of structural steel.*

Cleveland is one of the principal ports on the Great Lakes. An immense volume of freight is handled through the port in the seven or eight months of navigation. The principal items of freight are iron ore, coal and lumber, 8,812,583 tons of iron ore alone being received at Cleveland in 1913, a record year.

While large quantities of freight are handled over the lake-front docks, a considerable volume is delivered to the terminals along the Cuyahoga river. In its course through Cleveland, this river follows a winding channel in a deep valley. The river is only 300 feet in width and is crossed by a number of bridges. The general features of the situation are shown by the map, Fig. 6. The problem of navigating large passenger steamers on this river is a difficult one.

The dock of the Cleveland & Buffalo Transit Co. has been located for 27 years, since 1893, at 1290 West Eleventh street, on the east bank of the Cuyahoga river only a few hundred yards from its mouth, as shown in Fig. 6. In the short distance between the dock and the open lake, however, were two low level, swing-type bridges. One of these bridges, known as the Main street

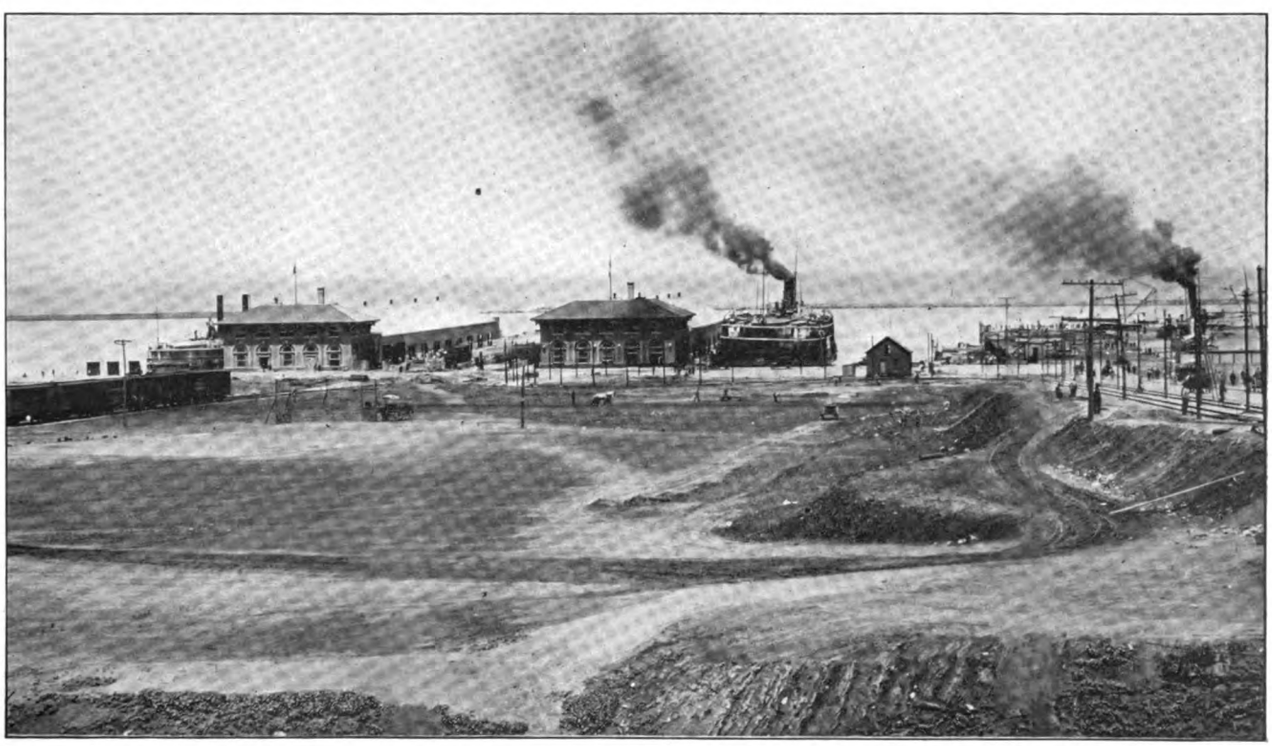

FIG. 1—VIEW OF NEW DOCK SHOWING BOAT LANDINGS AND FILLED-IN LAND

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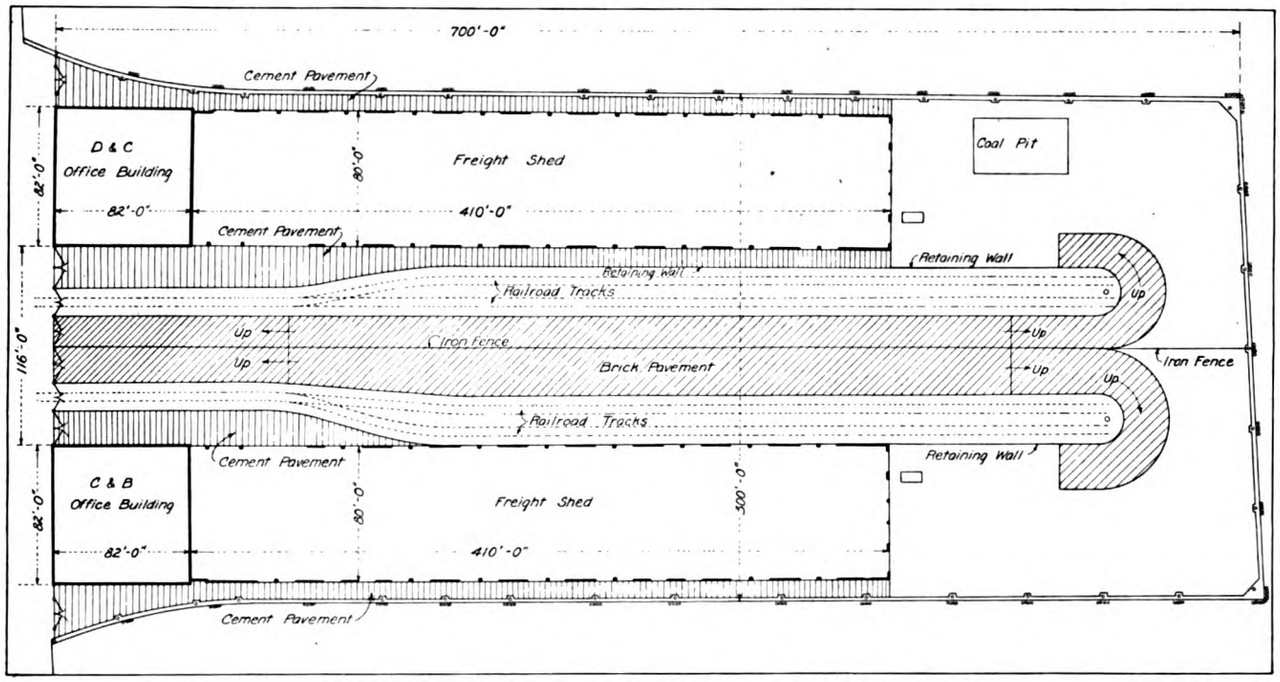

FIG. 2—GENERAL ARRANGEMENT OF NEW DOCK

bridge, gives a clear channel of only 100 feet for the passage of steamers. The big side-wheeler, SEEANDBEE, of the Cleveland & Buffalo line, which is 500 feet long with an extreme breadth of 98 feet, 6 inches, had a clearance of less than 1 foot on either side in passing this bridge.

Two warehouses were used by the Cleveland & Buffalo line in handling its traffic and this arrangement prevented rapid and economical loading and unloading of its steamers. The company does a large interchange business, that is, traffic carried in conjunction with railroads. In practically all cases, the freight had to be handled twice, from freight cars to the freight shed floor and later to the boats, or vice versa.

Two separate gangs of men were maintained to move the freight. One set of workmen, known as the street gang, handled freight from railroad cars, or city freight from wagons and trucks, to the floor of the warehouse. The second gang, the stevedores, handled freight between the boats and freight sheds. The expense of freight handling was further increased by the charges for towing the steamers from the main dock to the second freight warehouse and the loss in time of the street gang and stevedores while the boats were enroute.

Conditions confronting the Detroit & Cleveland line were closely parallel. Its

FIG. 3—NEW WAREHOUSE OF THE C. & B. TRANSIT CO.

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dock was built more than 60 years ago, the office building at that time being the home of Cleveland's first board of trade and the warehouse facilities were inadequate for the increasing traffic. The company's steamers were shifted from the warehouse to the various railroad docks along the river so that towing charges and losses of time were added to the ordinary expenses of handling freight.

In addition, officials of both lines in their desire to keep pace with the progressive advances in traffic problems, were wideawake to the truth of the statement that satisfactory traffic handling includes not only modern freight warehouses, but comfortable and attractive quarters for passengers. The old docks were not reached directly by any street car line and the surroundings compared unfavorably with various other Great Lakes ports where more modern docks have been built. In addition, the passengers, on leaving the steamers, were confronted by a climb up a steep hill.

The lack of available sites had delayed the building of new docks at an earlier date. Last year the city of Cleveland offered the filled-in land, which it owned, at the foot of East Ninth street, as a location for new terminals and the proposition was accepted by the steamship interests. The extent of this made land is indicated in Fig. 6, which also shows the location of the new dock and its relation to the old terminals located on the river front. The two companies are relieved from practically all of the traffic-handling and navigation difficulties that led to the abandonment of the old locations. Their steamers can reach the East Ninth street dock under their own power, avoiding towing charges except in very rough weather. The roadstead back of the government breakwater is commodious and affords ample room for handling the largest steamers. The boats formerly used the entrance at the river mouth and the Detroit & Cleveland boats will continue on this route, coming up back of the breakwater to the new dock. The Cleveland & Buffalo line steamers will round the eastern end of the breakwater at the foot of East Seventy-ninth street and follow a course in the rear of the breakwater, thus effecting a saving of 30 minutes in the running time between Cleveland and Buffalo.

Traffic handling arrangements at the new dock are greatly simplified and improved. A gentle incline leads from the water front to the center of Cleveland's business district, facilitating the receipt and dispatch of local freight. A siding from the New York Central Lines runs directly alongside each warehouse, providing quick dispatch for interchange freight. Of equal importance, the passenger quarters are large and attractive, and a street car line, passing directly in front of the dock, affords ready access to and from the steamers.

The managements of the lines also have arranged and equipped the warehouses so that the freight handling expense will be decreased. At the present time, the two sets of workmen are being employed but it is planned ultimately to combine them into a stevedoring gang. The ideal arrangement of the warehouses between the boat landings and railroad sidings, affords a simple solution to the problem of handling the interchange traffic. In most instances this class of freight is handled only once, the reverse of conditions at the old docks where two handlings frequently were necessary.

The Cleveland & Buffalo company is also employing automatic electric trucks, for moving freight. These trucks are of two tons capacity and are said to be easy to operate and control. They were furnished by the Automatic Transportation Co., Buffalo.

The general arrangement of the pier, warehouses and office buildings is shown in Fig. 2. The new pier is 700 feet long and 300 feet wide, and has ample frontage for docking five steamers at one time. The combined office building and warehouse of the Detroit & Cleveland line is located at the west side of the pier, with two railroad switches adjoining on the east. The office and warehouse of the Cleveland & Buffalo line is on the east side of the pier beyond the railroad tracks. The office buildings are each 82 x 82 feet, two stories high with attic. The warehouses are each 400 feet long, and 80 feet wide. The distance from the

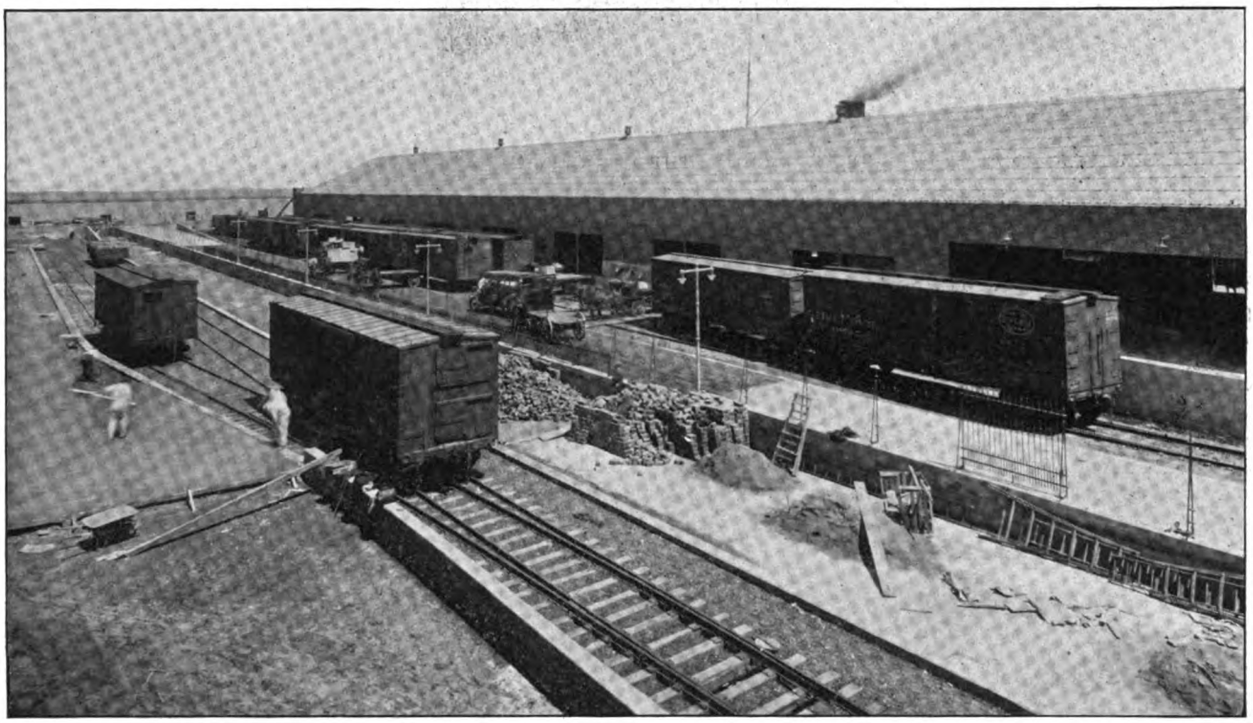

FIG. 4—ARRANGEMENT OF RAILROAD TRACKS AND ROADWAYS BETWEEN FREIGHT SHEDS

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FIG. 5—WAITING-ROOM AND TICKET OFFICE OF THE C. & B. LINE

warehouse floor to the peak of the roof is 38 feet. From the floor to the bottom roof chord is 16 feet.

By the agreement between the steamship companies and the city of Cleveland, under which the dock was built, the former furnished approximately $500,000 to construct the pier and buildings, grade the street approach and erect a new bridge over the railroad tracks which cross East Ninth street. A fixed sum is to be charged off each year for 40 years, when the docks will revert to the city. Provision was made for the proper upkeep of the docks.

The construction of the pier was started in May, 1914, and it was completed in October. Work on the buildings was started immediately. As stated previously, those on one side were completed the first week in June, while the others will be finished by June 25.

An old pier, located on the site of the one just completed, was utilized for filling purposes. More than 5,000 oak piles were driven into the lake bed, the penetration being 25 feet.

The piles were from 50 to 55 feet long. Along the face of the dock, the piles are driven on 3-foot centers and are protected by waling strips and sheet piling. A second row was driven 4 feet back, spaced on 4-foot centers. A third row, also spaced on 4-foot centers, was driven 5 feet back of the second row. The outer piles and timbers are held together by 2-inch tie rods. On the top of the piles is an iron mesh. The fill consisted of rock, sand and dirt.

The office buildings rest on clusters of four piles, spaced 20-foot centers. Under the bearing piers are clusters of six piles, spaced 15-foot centers. Two staggered rows of piles support the walls of the office buildings. These piles are spaced 4-foot centers, giving a uniform bearing surface. The columns of the freight shed walls rest on concrete piers supported by clusters of three piles, spaced 20-foot centers. The walls between the piers are supported by beams, heavily reinforced.

Along the face of the dock, 33 cast iron mooring posts are anchored in the concrete. These are arranged 14 to a side, with five on the front. There are 41 groups of wooden fender piling, arranged four piles to a group with nine piles in the corner clusters. These piles are faced with 4-inch oak planks.

The office buildings are concrete and brick, 82 x 82 feet, two stories high with attic. The interior columns are concrete. In the arrangement of the Cleveland & Buffalo line office, which was the first thrown open for use, the ticket, billing, passenger agent's and freight cashier's offices, filing and baggage rooms and the general waiting room are on the first floor. The latter is liberally designed, as shown in Fig. 5. On the second floor are the offices of the general manager, auditor, traffic manager, operating officials and a store room.

The interior of the building is trimmed in oak with marble wainscoting. The floors in the waiting and rest rooms are tile and concrete. The roof is of terra cotta roofing tile. At night, the exterior of the buildings is brilliantly illuminated by electric lights.

The freight sheds, as shown in Fig. 3, are of steel frame construction, 80 feet wide and 400 feet long. They are roofed with cement tile, 180 skylights aiding in making the interior exceptionally well lighted. The sheds have brick walls to the eave line. The roof is of truss type construction, leaving the warehouse floor free from any obstructions. Oak plank flooring is used in the shed of the Cleveland & Buffalo line, while a concrete floor is laid in the Detroit & Cleveland line freight house.

The steel columns at the sides are spaced on 20-foot centers. There are 36 steel rolling-type doors provided on the two sides which permit quick access to any part of the warehouse floor. Automatic scales were installed by the Winters Coleman Scale Co., New York.

The lighting facilities in the freight sheds are ample to provide sufficient illumination at all times. There are 40 lights, arranged in two rows of 20 each, in each shed. These lights are of the nitrogen-filled type, 100 watts.

At the water side of the sheds is a 12-foot concrete platform. On the op-

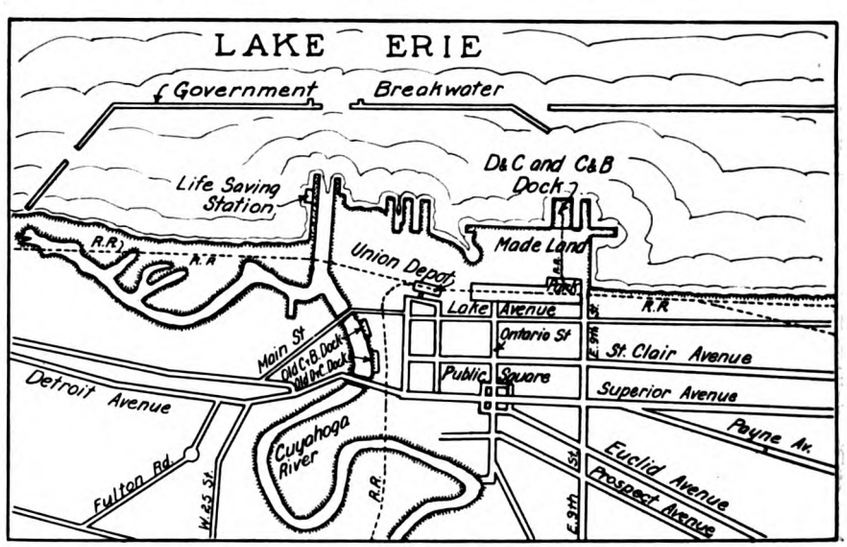

FIG. 6—CLEVELAND HARBOR SHOWING OLD AND NEW DOCKS

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posite side, a concrete roadway leads directly into the sheds, affording ready access to trucks or wagons handling local freight. Brick roads used by wagons or trucks in reaching the north end of the warehouse or pier directly adjoin the roadways. At the north end, the freight sheds are elevated for three-fourths of their width to permit the unloading of trucks or wagons. The balance of the shed is at ground level, allowing vehicles direct access to the floor. All of the concrete for flooring purposes was furnished by the Klein Mfg. Co., Cleveland.

Paralleling the roadways, as shown in Fig. 4, are the railroad sidings. A one-track switch from the New York Central Lines, divides into two switches serving each freight shed, these switches again dividing into two switches and giving a capacity for 60 cars. The railroad tracks are 4 feet below dock level at their northern end, where a 12-inch retaining wall, as shown in Fig. 4, is provided.

Exterior lighting includes a row of lights under the cornices of each shed and along the face of the dock. The latter extend around the water edge for its entire distance. In addition, 200-watt lights, mounted on posts at 67-foot intervals, are located on the dividing line between the two properties. A concrete wall surmounted by a wrought iron fence, marks this line. The Cleveland & Buffalo Transit Co. has installed a five-ton pillar crane north of its freight shed for handling heavy freight.

The Detroit & Cleveland Co. will use the north end of its dock as a coaling station. The equipment includes a locomotive crane, storage pit and hopper. The pit will be at the north end of the railroad sidings, the crane operating on the second track. This pit will be 11 x 25 feet and 5 feet deep below the rail. The crane will command the railroad siding, pit and hopper. The latter will be 19 x 21 feet. Its location is shown in Fig. 6. The combined storage capacity will be about 100 tons.

George R. Cooke, Cleveland, had the contract for designing and constructing the dock.

A Foundry on Shipboard

By F. M. Perkins, U. S. N.

THE NAVY'S largest floating foundry in commission is on board the U. S. S. Vestal, the repair ship of the U. S. Atlantic fleet. This foundry's mission is to produce the castings required for the repair work of the 21 battleships and several auxiliaries of the Atlantic fleet when in foreign waters or away from the navy yards.

When one realizes that the modern battleship is an immense machine performing most of its functions mechanically or electrically, some idea may be formed of the amount and great variety of castings necessary to supply those worn out and broken in use. Of course, only the comparatively small castings are made on the Vestal, and only those which are more or less in

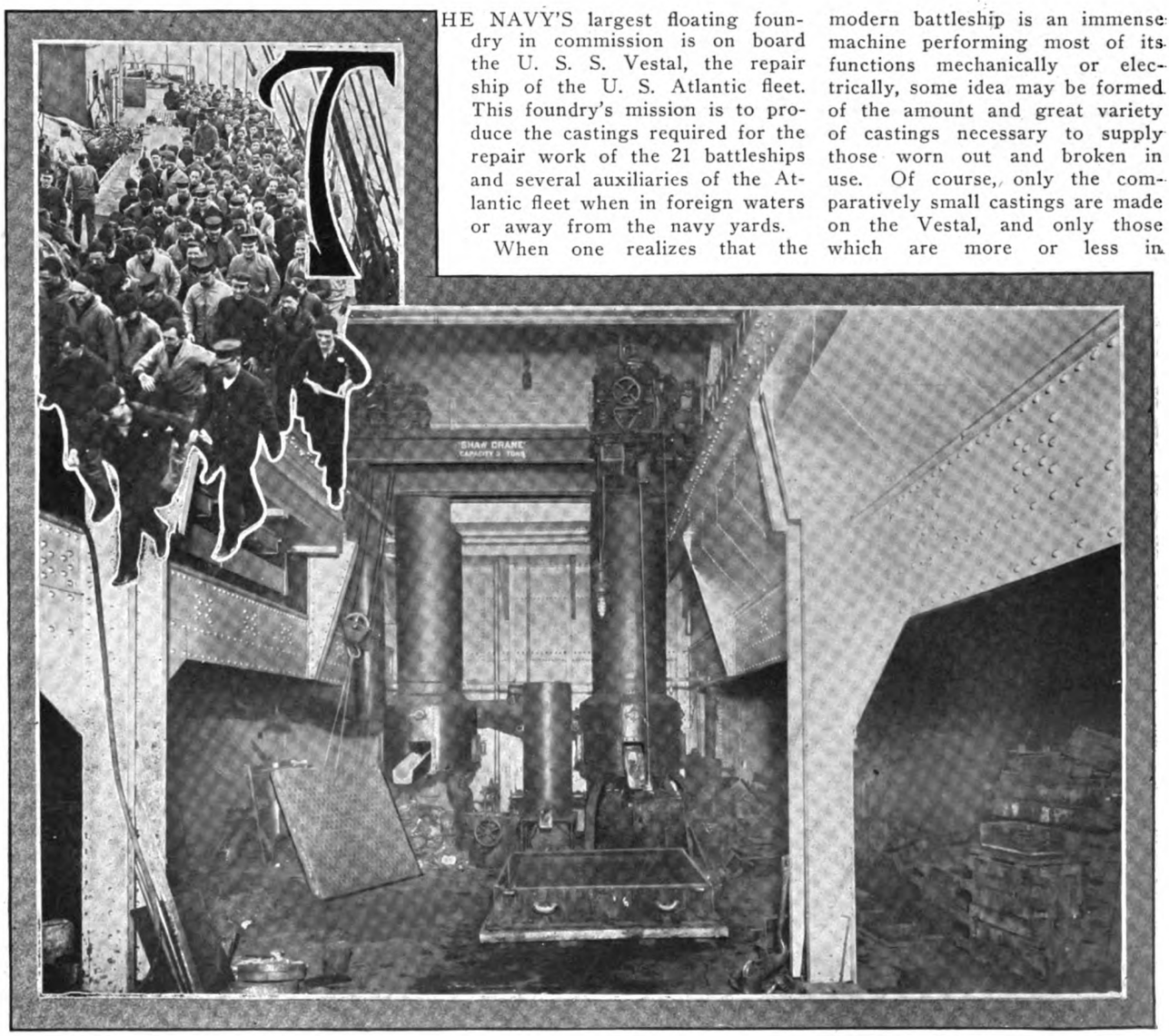

FIG. 1—RETREAT FROM MUSTER, ALL HANDS GOING TO WORK

FIG. 2—THE MAIN BAY OF THE FOUNDRY ON BOARD THE U. S. S. VESTAL

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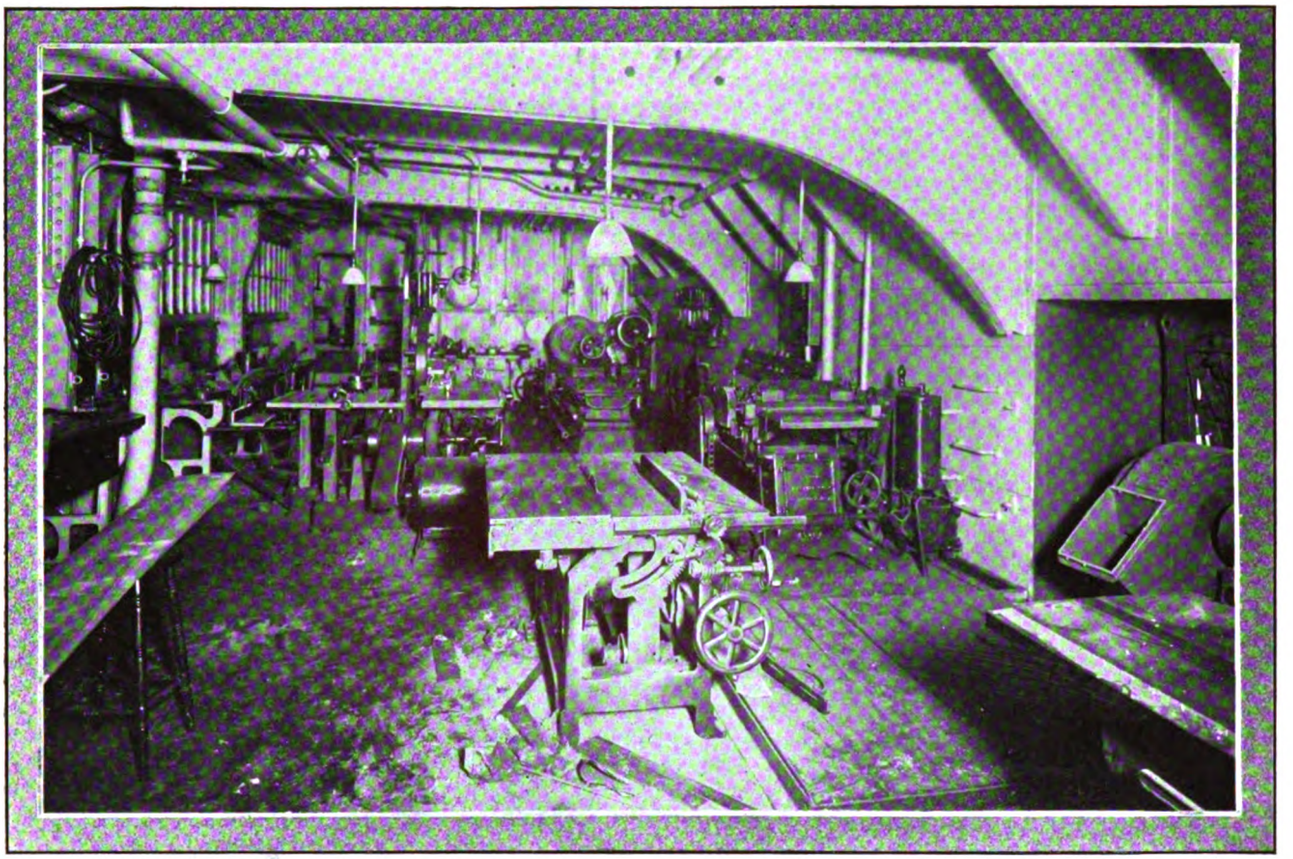

FIG. 3—FORWARD END OF THE PATTERN SHOP ON BOARD THE U. S. S. VESTAL

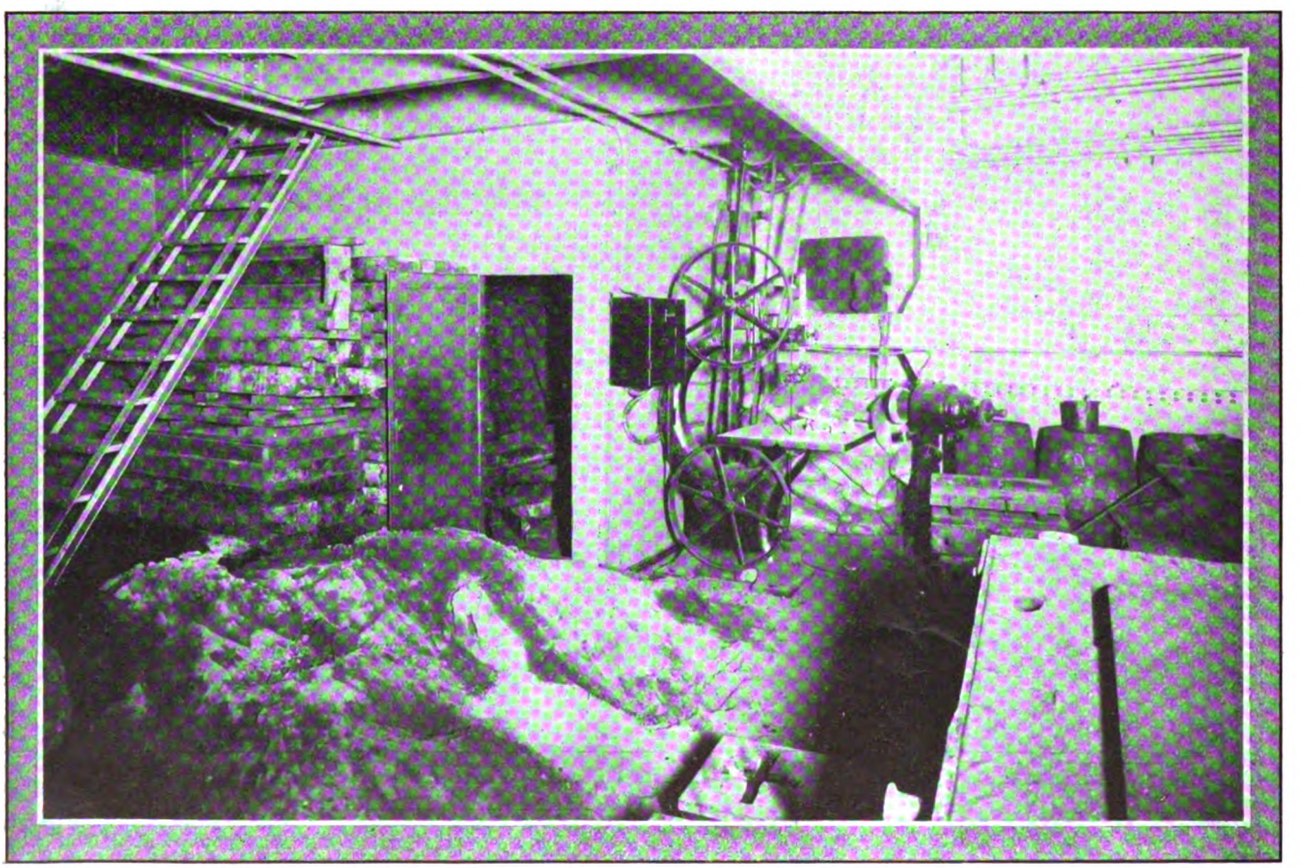

FIG. 4—THE FOUNDRY CLEANING DEPARTMENT, SHOWING THE SAND BLAST ROOM

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the class of emergency repairs, but of these there are enough to keep the foundry busy.

The Vestal is a ship of 12,585 tons displacement, 465 feet 10 inches in overall length, 60 feet in breadth, and 16 knots speed. She was originally designed for, and operated as a collier, her conversion to a repair ship having been completed in the latter part of 1913. In addition to the foundry and pattern shop, she is fitted with a machine shop, electrical shop, boiler shop, smith shop, copper and sheet metal shop, carpenter shop and optical shop. There is also an extensive general store which must keep in stock a six months' supply of some 8,000 items of repair material.

A similar repair ship, the Prometheus, now is being fitted out at San Francisco, for similar work in the Pacific fleet.

The product of the foundry consists of gray iron, semi-steel, crucible steel, Monel metal, and all the various brass foundry alloys and white metals used in marine and electrical engineering and ordnance work.

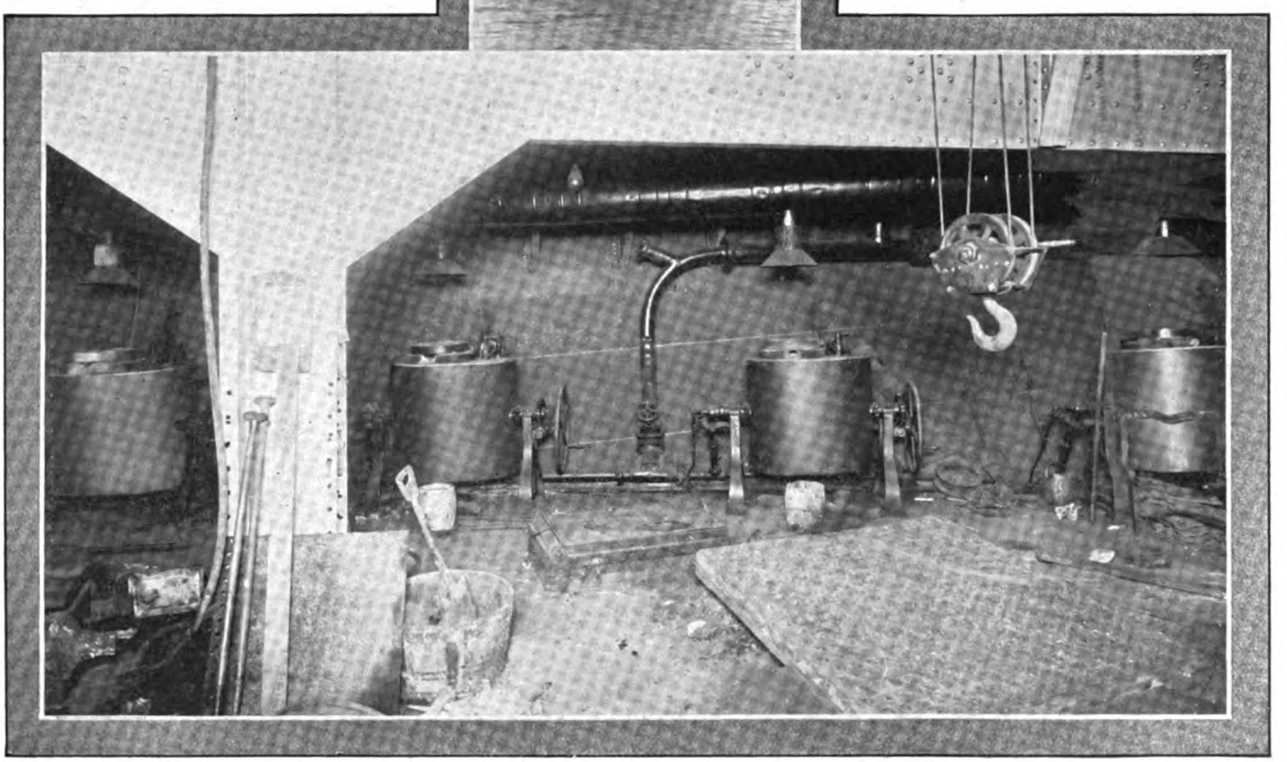

FIG. 5—THE REPAIR SHIP VESTAL
FIG. 6—THE BRASS MELTING DEPARTMENT ON BOARD THE U. S. S. VESTAL

An idea of the range of work done may be formed from the following partial list of castings made during the past two months for the battleships while engaged in winter training at Guantanamo bay, Cuba:

1 main engine piston ring.
1 feed pump plunger.
20 valve discs for pumps of various sizes.
24 dogs for gun ports.
1 cylinder for ice machine.
1 bushing for main engine piston rod packing.
150 grate bars.
1 former for ice machine leathers.
3 whaleboat keels.
1 trailer wheel for 3-inch field gun.
9 coaling boom sockets.
4 motor boat clutch covers.
1 gun sight bracket for 12-inch turret.
2 boiler feed pump pistons.
2 heads for motor muffler.
16 parts for 8-inch shell extractors.
1 icemaking box.
2 yokes for coaling engines.
46 deck clocks.
4 ice machine valve seats.
60 manifolds for soot blowers.
1 cylinder head for steam launch engine.
2 rings for sounding machine.
1 ice machine cylinder lever.
100 boiler flame plates.
2 30-inch gears for jacking engine.
2 circulating pump engine piston rings.
4 turbine engine saddle blocks.
8 scupper flaps.
36 brazing flanges.
2 14-inch steam valves.
4 rudder gudgeons.
3 steam launch propellers.
3 slide valves for pumps.
2 12-inch ammunition car tray handles.
2 2,500-pound bending slabs.
4 galley range panels.
Numerous billets, blanks, bushings, etc.

The foundry, which is in the after end of the ship, occupies a compartment 43 feet wide aft, 51 feet wide forward, and 51 feet long, giving a floor space of about 2,400 square feet. On either side of this compartment at a height of 9 feet above the deck is a gallery running fore and aft, as shown in Figs. 2 and 7. In the starboard gallery is the coreroom, and in the port gallery, the pattern shop. Below the foundry floor is the hold, which affords stowage space for patterns, pig iron, scrap iron, sand, limestone, plumbago, etc., and for the flasks.

As may be readily imagined, one of the greatest problems in this foundry is the apportionment of space. The large variety of castings made requires a rather complete assortment of flasks, which adds to the difficulty of finding stowage room. Special effort therefore has been directed toward utilizing all the available space to the best advantage

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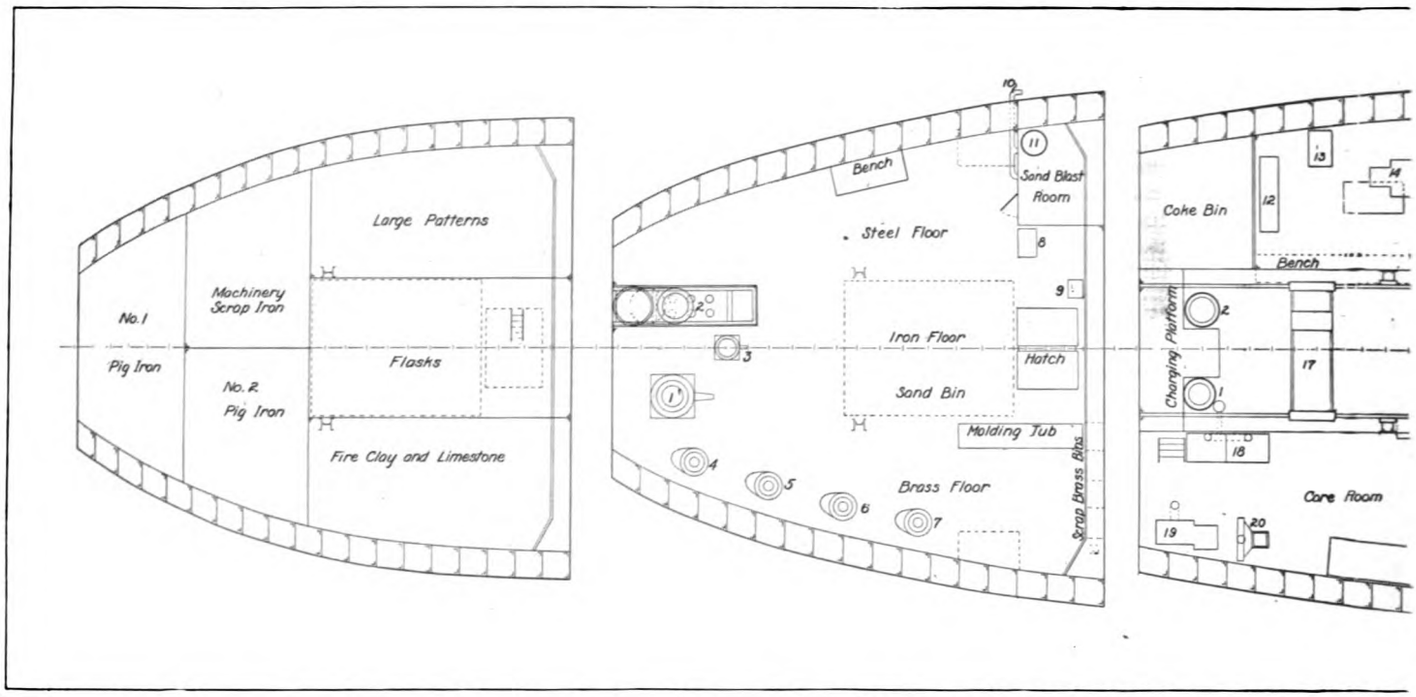

FIG. 7—GENERAL ARRANGEMENT OF THE FOUNDRY AND

and toward operating on the maxim of "A place for everything, and everything in its place."

The general arrangement of the stowage space in the hold is shown in Fig. 7. The melting equipment consists of one 30 inch cupola, one 16 inch *baby* cupola built by the ship's force, a six-pot, oil-fired, crucible steel furnace, built and installed by the ship's force, and four oil-fired tilting crucible brass furnaces. Of these latter, two have a capacity of 200 pounds each, and two of 375 pounds each. The cupolas and steel furnaces are in the after end of the foundry and the brass furnaces on the starboard side under the core-room gallery. The lower part of the large cupola shown in Fig. 2 has been removed, and the steel furnace occupies this space. The old cupola stack was retained for the steel furnace, and 16 feet added to its height.

The blower equipment consists of a Sturtevant fan driven by a 17½ horsepower motor for the cupola blast, and a General Electric centrifugal blower driven by a 10-horsepower motor for the brass melters, both blowers being so connected that either blower may furnish the blast for brass or iron.

In the center of the foundry, flush with the floor and extending down into the hold is a large steel tank which serves as a pit for heavy castings, and for sand stowage. This bin is decked over, so that the top is flush with the foundry floor, and the space is used for molding.

On the port side forward is the sand blast room fitted with an exhaust system which discharges the dust overboard within a few inches of the surface of the water. The main bay of the foundry is served by a 3-ton Shaw electric traveling bridge crane.

The core room equipment consists of two Whiting, coke-fired, sectional core ovens, a large coremakers' bench, and suitable bins and tanks for the stowage of core sand, flour, molasses, plumbago, oil, etc. The blowers also are located on the core room floor. In the forward end of the core room are two 200 gallon fuel tanks from which the oil, under air pressure, flows through a steam heater to the furnaces. The cleaning department under the port gallery has a bench and vises, a motor-driven metal band saw, grinder, and air hammers.

Air for the tools is supplied at 100 pounds pressure by a 500 cubic foot air compressor situated in another part of the ship. Oxy-acetylene is used for removing heavy risers. The pattern shop in the port gallery extends 51 feet beyond the forward end of the foundry and is a combined pattern and carpenter shop.

The pattern shop equipment consists of the following:

1 60-inch patternmaker's gap lathe.
1 speed lathe.
1 planer.
1 universal woodworker.
1 mitering machine.
1 saw filer.
1 emery grinder.
1 24-inch patternmaker's lathe.

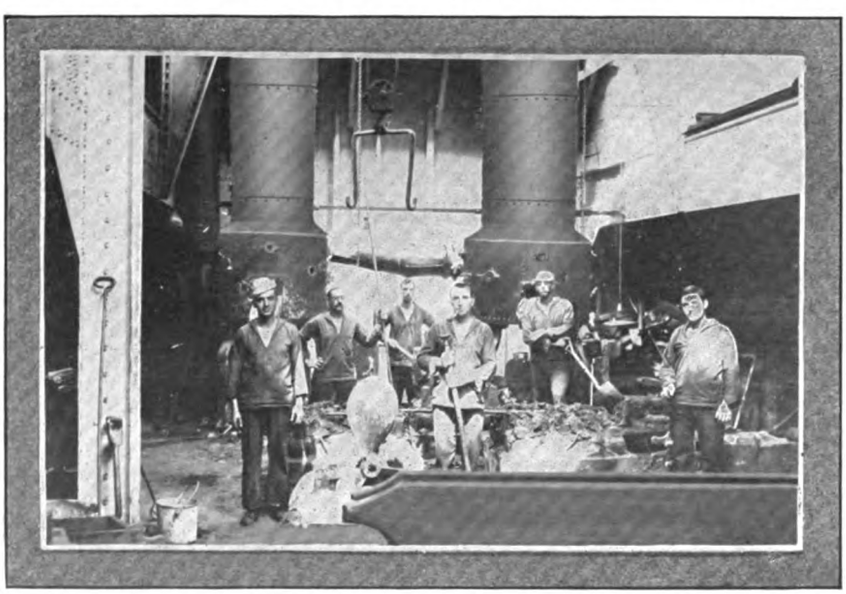

FIG. 8—THE SHAKING-OUT CREW ON BOARD THE VESTAL

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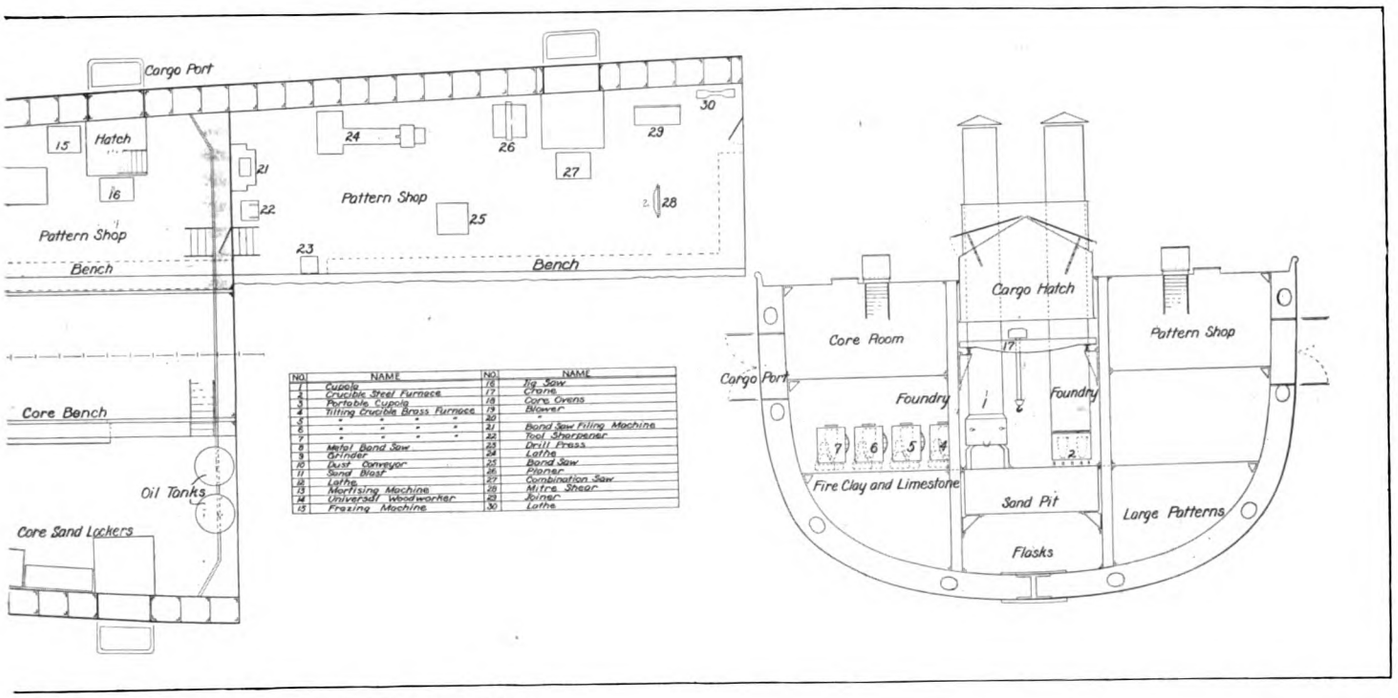

PATTERN SHOP ON BOARD THE U. S. S. VESTAL

2 bandsaws.
1 joiner.
1 mortising machine.
1 shaper.
1 knife grinder.
1 saw filing machine, and suitable benches and tool cabinets.

Obituary

Captain F. C. Starke, vice president of the Milwaukee Dry Dock Co., one of the component parts of the American Ship Building Co., died at his home in Milwaukee on May 17. In his early days he had been a lake master, but in 1891 purchased the Wolf & Davidson ship yard, which later became the Milwaukee Dry Dock Co. When the American Ship Building Co. was formed, in 1899, the plant entered the combination of lake yards. Captain Starke had not been active for several years owing to ill health. He was a member of the Society of Naval Architects and Marine Engineers and also of the Ship Masters' Association.

Merritt & Chapman Derrick & Wrecking Co., 17 Battery place, New York, announces that it has resumed work on laying the Narrows siphon across New York bay.

A derrick as well as other vessels engaged in handling the 36-inch pipe which makes up the siphon are now moored in the stream between the foot of Seventy-ninth street, Brooklyn, and Tompkinsville, N. Y. Passing vessels are requested to slow down and give this plant as wide a berth as possible.

Latest Marine Patents

Copies of any one of these patents can be obtained by sending fifteen cents in stamps to Siggers & Siggers, patent lawyers, Washington, D. C., by mentioning *The Marine Review.*

No. Title and Inventor.

1,138,783 Internal Combustion Engine — Ignace Perugini, Toronto, Ontario, Canada.

1,138,862. Vessel—Charles Gora, Athabaska Landing, Alta., Canada.

1,138,876. Internal Combustion Engine — Charles M. Leech, Lima, O.

1,138,919. Two-Cycle Engine—Frank W. Willey, Boston, and William Galletly, Melrose, Mass., assignors to Carbon-Oxygen Gas Engine Co., Boston, Mass.

1,139,113. Torpedo-Guard—Austin M. Evans, Potts Camp, Miss.

1,139,116. Holding and Disengaging Gear for Ships' Boats — Henry William Gavin, Edinburgh, Scotland.

1,139,202. Anchor — Jerry Masak, Detroit, Mich.

1,139,239. Torpedo-Guard—Erasmus R. Trammell, Lakeland, Fla.

1,139,364. Internal Combustion Engine—Herbert F. Obergfell, Chicago, Ill., assignor of one-third to Talbot G. Martin and one-third to John Erickson, Chicago, Ill.

1,139,409. Safety Appliance for Submarine Vessels — James S. Fraser, Boston, Mass., assignor of one-half to Ira C. Moulton, Boston, Mass.

1,139,471. Boat-Propelling Mechanism—Staniszlaw Armaczki, Natrona, Pa.

1,139,631. Boat-Motor — Edward B. Blakely, Muskegon, Mich., assignor to Gray Motor Co., Detroit, Mich., a Corporation of Delaware.

1,139,700. Water-Closet for Yachts and Other Small Boats—Philip E. Monroe, Weymouth, Mass.

1,139,713. Internal Combustion Engine—William H. Osterman, Fonda, Iowa.

1,139,770. Internal Combustion Engine—Felix Joswich, St. Paul, Minn.

1,140,046. Device for Launching Life Boats—Robert William Leeming, Brantford, Canada.

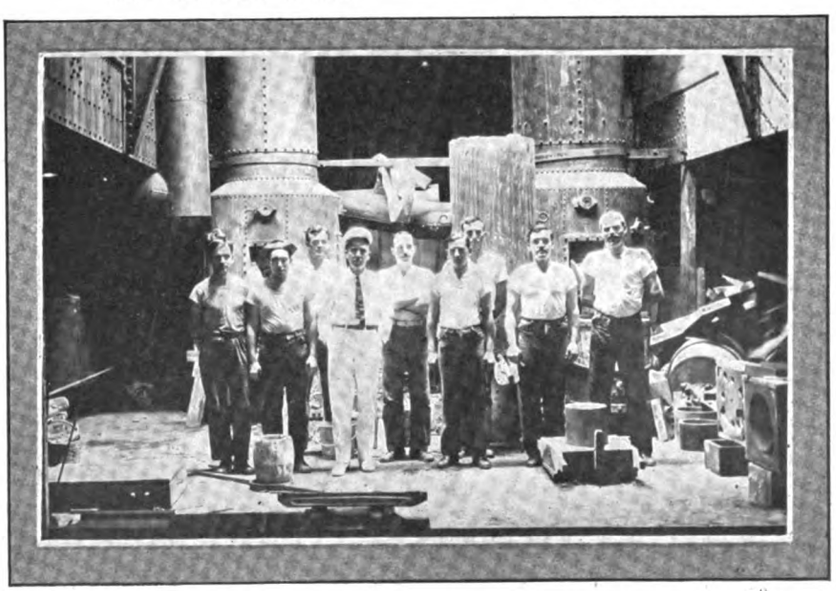

FIG. 9—THE VESTAL'S FOUNDRY FORCE

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On the Coasts, Lakes and Rivers

What's Doing and Who's Doing It

Along the Atlantic Coast

By C. B. Hill

LEASE of the entire works of the William Cramp & Sons Ship & Engine Building Co., Philadelphia, is under negotiation, according to what are believed to be well founded reports. A large steamship company is said to be conducting the negotiations and Henry Hand, vice president of the Cramp company, replying to a question concerning the proposal, is quoted as saying "it is half true". He is said to have admitted the negotiations by the steamship company, but adds they are not yet closed. The name of President C. M. Schwab, of the Bethlehem Steel Co., is mentioned in connection with the transaction.

A new ferry line has been established from Dyckman street, New York City, across the Hudson river to the foot of the Palisades opposite Englewood. It is planned to run boats across the river on a 20-minute schedule on week days and a 5-minute schedule on Sundays to accommodate sightseers.

The steamer DAISY MITCHELL, formerly owned by the Freeman Steamship Co., Philadelphia, has been sold to the Standard Oil Co. of California for the San Francisco and Mexican trade.

The Italian bark ROSALIE D'ALI, which was sunk in collision in Hampton Roads in 1913, and after being raised was sold to the Boston Iron & Metal Co., has been placed in the dry dock of the Baltimore Dry Docks & Ship Building Co., Baltimore, Md., for inspection preparatory to being sold or converted into a barge. This vessel is now under American registry.

The shipyards at Bath, Me., have more work on hand at present than they have had for three years. At the yard of the Kelley-Spear Co. three huge wooden barges for the coal-carrying trade are under construction. The G. G. Deering Co. will begin work early next month on a five-masted schooner. Percy & Small are considering the building of a four-masted schooner, and at the yard of Frank S. Bowker & Son, at Phillipsburg Center, Me., a three-masted wooden schooner is under construction. At the plant of the Bath Iron Works preparations are being made for building two large topedo-boat destroyers for which the contracts were awarded last winter. This concern also has a contract for building a pleasure yacht.

Bucknam Pasha, an American citizen, who was formerly rear admiral in the Turkish navy, died Thursday, May 27, at Constantinople, after an illness of several weeks. Bucknam Pasha, or Ransford D. Bucknam, as he was known in this country, was 47 years old and followed navigation on the seas and Great Lakes all his life. In 1902 he came to the William Cramp Ship & Engine Building Co., Philadelphia, being employed as a navigating officer. The Turkish cruiser MEDJIDIEH was completed by the Cramps the following year and Bucknam was commissioned to take her to the Bosphorus. The war craft was a novelty to the Turks, and they didn't know what to do with it. Abdul Hamid, the Sultan, solved the problem by retaining Bucknam on his payroll, offering him the vice admiralty of the empire at a large salary. Bucknam accepted and he was entrusted with the task of building the Turkish navy. About $20,000,000 were set aside by the Sultan for this purpose. In 1911 Bucknam married Miss Rose Thayer, of San Francisco, who survives him. Only once since leaving Philadelphia with the Turkish warship did he return to the Atlantic coast. In the year following his marriage, he spent his honeymoon in the United States, paying Philadelphia a brief visit.

In the Pacific Northwest

By F. K. Haskell

THE POWER schooner RUBY, owned by J. E. Shields and Capt. Knaflinch, sailed from Seattle, Wash., recently, for farthest north on the continent, with a cargo of supplies for points between Unalaska and Herschel island. Capt. S. H. Cottle, who is in command, has taken on stores and supplies for a year, and the summer months will be devoted to whale hunting, after the freight has been delivered to the northern points.

Repairs to the extent of $100,000 were necessary on the Blue Funnel liner PROTESILAUS after her nine months of service as a collier on the Pacific coast. The repairs were made at Vancouver, B. C., the British navy footing the bill.

A full cargo of lumber for Europe has been loaded at the Hastings Mill in Portland, Ore., by the Russian four masted bark LUCIPARA which reached Victoria, B. C., May 14, 85 days out of Melbourne.

Robert Dollar, well known marine man of the Pacific coast, says he is through with the United States flag for his vessels. The adoption of the seaman's act caused his decision. He is quoted as having announced at a meeting at Honolulu recently that he would transfer all his vessels back to the British and Chinese flags.

Close to 40 carloads of automobiles are standing on the railway tracks in Seattle and twice as many on the tracks in Tacoma, their owners paying demurrage, while liners are awaited to carry them across the Pacific to Vladivostock.

J. W. Jury, who has been first officer of the steamer HONOLULU, has resigned, and Capt. Foster Ryer, formerly of the steamer ISTHMIAN, has taken his place.

The net earnings of the Canadian Pacific steamship lines in the west for 1914 were $925,000; preferred dividends of $437,500 were paid; office expense,

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interest, depreciation, amounted to $918,700 and the debit balance is $521,200.

With heavy passenger bookings, the White Pass & Yukon River System's steamboat service on the Yukon river was inaugurated June 1, with two sailings from Whitehorse. The steamboat ALASKA left on that date on the first through trip of the season, to Fairbanks, taking passengers to Fairbanks without transfer.

Although the boat building yards and motor craft industries in Vancouver, B. C., are still feeling the pinch of the economic condition induced by the war, and undoubtedly will continue to be depressed until a universal re-adjustment takes place, a decidedly more optimistic feeling is manifesting itself in view of the placing of several orders for new boats and the activity in repair work, especially as regards boats used for commercial purposes. The commercial power boat in the west, as in all other centers, has become an indispensable factor in up-to-date water transportation.

Under the supervision of Easthope Bros., of Vancouver, B. C., a 30 by 8-foot cruiser of the combined workboat and pleasure craft type was built for the Dominion Government Telegraph service during the past month. She follows staunch lines being designed for general utility work along the British Columbia coast in all sorts of weather. The plant is a 7-horsepower Frisbie. Another similar type has been supplied by the same firm for J. Nordan, a Vancouver fisherman, the plant being a 7-horsepower Mianus engine.

Headquarters for the now quite extensive fleet of power boats operated by the British Columbian government in its fire protection, patrol and timber cruising services, have been established by the Provincial authorities at Thurston bay, Valdez island. The depot, on the route of the main steamship lines to Alaska and the north, as well as being centrally located, enables the government to effect important economies in the way of fuel and supplies. There are 32 boats in the various services, ranging all the way from small power boats to large modern cruisers of the 80-foot class. In order to carry out repairs and general overhauling a 400-foot marine slip has been installed. A large shed has been built for the plant with storage space and machine shop overhead. There are three large floats, one being fitted with fuel tanks.

Comyn, Mackall & Co., San Francisco, are named as agents for a new line to operate between the Orient and the Pacific coast ports, using tramp steamers, the first of which will be the Japanese steamer BANKOKU MARU. She is on her way to the Golden Gate with cargo and will proceed to Portland with a shipment of linseed, after which she will proceed to load lumber for Shanghai under engagement to the China Import & Export Lumber Co.

The famous power schooner KING & WINGE, has been chartered by the U. S. coast and geodetic survey for use in Alaska waters this summer. The craft will be used in the wire drag survey work authorized by the last session of congress. To meet with the requirements of the force that will use her a deck house has been added to her upper work and other alterations made. KINGE & WINGE has had a checkered career. She is named after an old Seattle marine repair firm.

Up and Down the Lakes

By A. A. Eiben

COL. Charles L. Potter, formerly United States engineer in charge of the Duluth-Superior district and now in charge at St. Paul, Minn., will be transferred to Portland, Ore., June 24, where he will have charge of two Portland districts and one at Seattle.

James Tyler and Henry Simpson, steamboat inspectors from the Norfolk, Va., district, who were assigned to the Great Lakes district for spring work, have returned to the Norfolk district. Inspectors Alan S. Johnston and John Wright, from the New York district, who were likewise temporarily located on the lakes, have returned to New York.

Contract for dredging the Niagara river to connect the Canadian canal at Grand Island with Niagara Falls was recently let to Breyman Bros., Toledo, O., on their bid of $38,850. This work has long been urged for the convenience of pulp carriers, most of whose cargoes are destined for Cataract City firms and who are now obliged to discharge their cargoes at Grand Island owing to the shallow channel.

The passenger steamer CITY OF HOLLAND, of the Graham & Morton Transportation Co.'s fleet, has been sold to the Goodrich Transit Co., Chicago, Ill. This steamer will be used on the Chicago-Milwaukee run of the Goodrich line to replace the steamer IOWA, which was lost in the ice jam off Chicago early in the year.

Excursion passenger steamship service on the Great Lakes opened May 15 this year as against May 1 in previous years owing to the new government regulation which establishes May 15 as the opening date and Sept. 15 as the closing date for the excursion season. The new regulation has no particular bearing on the trade, however, as passenger traffic does not become sufficiently heavy for excursions before May 15, and is practically over by Sept. 15, unless the weather is exceptionally warm.

Charles A. McMorris, who for more than 15 years has been employed in the transportation department of M. A. Hanna & Co., Cleveland, has resigned to become associated with R. A. Williams in the vessel and lake transportation business with offices in Cleveland. William E. Newberry, assistant to J. M. Amsden, superintendent of the Ohio & Western Pennsylvania Dock Co. at Ashtabula, will succeed Mr. McMorris.

The steamer NORMANDIE is being operated in the coal trade between Ohio ports and the rivers by Capt. Robert Pringle, Rockefeller building, Cleveland, who recently purchased the vessel.

The barge AURORA, formerly owned by Henry Wineman Jr., Detroit, has been purchased by the Pringle Barge Line, Rockefeller building, Cleveland.

Baron H. Sugi, a civil engineer representing the construction department of the imperial government of Japan, recently inspected the ore docks at Ashtabula. The Baron was much impressed with the Hulett ore machines and coal loaders, and declared the harbor of Ashtabula to be the best he had ever seen. He will remain in this country several months.

Some interesting records have been made recently by the Duluth, Missabe & Northern ore docks at Duluth, Minn. Despite unfavorable circumstances, such as bad weather and low water, 86,000 tons of ore recently were loaded into 10 vessels in 10 hours. The railroad crews made a record in handling cars which carried the ore

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up to the pockets on the dock, 1,213 cars being unloaded while the boats were being tied up. Another record in dispatch made several days previous to the foregoing consisted of 71,400 tons of ore being loaded into 10 vessels in 10 hours, the 10-hour period including the time required to enter the harbor, tie up at the dock, manipulate the spouts and get away.

The steamer GLEMOUNT, belonging to the Montreal Transportation Co., Ltd., Montreal, Que., ran aground on Lake Ontario and is now in dry dock at Kingston, Ont. Twenty-seven plates will have to be taken off the vessel. Henry Peters, master of the vessel, was exonerated by Wrecking Commissioner Demers after an investigation held at Kingston. Captain Demers held Pilot Frank Papineau responsible for the accident, charging careless navigation. The vessel was in charge of an unlicensed pilot.

The passenger steamer SEARCHLIGHT has been purchased by Capt. Edward Hassen, who will enter her in the fish trade at Duluth.

The interstate commerce commission recently granted the Pennsylvania and Canadian Pacific railroads' application to continue the operation of the car ferry ASHTABULA between Ashtabula and Port Burwell, Ont., despite the Panama canal act.

A unique marine suit is being tried in the circuit court at Port Huron, involving Henry McMorran, former congressman, as complainant and the Lake Transit Co., Bay City, Mich., as defendant. McMorran asks $2,500 damages for the use of his dock during the winter of 1913, and alleges also that the view of his home was obstructed. The business men's association of Port Huron invited the owners of the vessel to berth the vessel at that port and the suit is arousing much comment.

The ocean-going steel tug G. C. CLEVELAND, which left New York harbor on April 21, reached Ashtabula on May 22. CLEVELAND was purchased from the New York Central railroad by the Edward Gillen Dock, Dredge & Construction Co., Racine, Wis., and Ashtabula, O., and will be sent to Cleveland to assist in breakwater work. The tug was in command of Capt. Fred Rouse, and with the exception of encountering heavy ice off Nova Scotia, had an uneventful trip.

Changes have been made in the east breakwater lights, Cleveland. A group flashing white light of 280 candlepower to show a group of two flashes every 6 seconds has been established in the east end of the east breakwater about 40 feet above the water on a white pyramid skeleton tower with enclosed base. The Cleveland east breakwater extension light will be discontinued.

The interstate commerce commission recently granted authority to the Pere Marquette railroad to operate car ferry steamers on the lakes and rivers. The Bessemer & Lake Erie railroad was given permission to operate on Lake Erie and the Ann Arbor railroad was also granted permission to retain ownership of its ferry boats operated on Lake Michigan.

The American Ship Building Co. will construct at its Lorain yard six boilers for the three steamers which the Great Lakes Engineering Works of Detroit will build for the Clyde Steamship Co., of New York.

The ferry steamer NIAGARA FRONTIER recently met with a thrilling accident when her wheel jammed and the ferry drifted helplessly down the Niagara river. The current in the river being strong, the ferry was being swept toward the international bridge, causing great consternation among her 60 passengers. The tug INTERNATIONAL saw the plight of the ferry and set out for her just in time, getting a line to her 200 feet above the bridge and towing her to dock. Had the boat struck the bridge a serious accident would have resulted.

The Lake Shore Construction Co., Cleveland, has been awarded a contract for the construction of a breakwater at the coast guard station at Marblehead. Patrick O'Brien, president of the construction company, has had charge of a large amount of breakwater work on the lakes.

The war department has awarded a contract for the construction of concrete masonry for the fourth lock of St. Marys river to the Oscar Daniels Co., Chicago, on its bid of $1,010,480. The Daniels bid was the lowest of 13 received by the war department.

Capt. L. V. Frazier, U. S. A., Buffalo, has been promoted to a majorship in the United States army engineer corps.

Work is progressing rapidly on the construction of the new Canadian light station marking the intersection of the Livingstone and Amherstburg channels, above the head of Bois Blanc island, lower Detroit river. It is expected the structure will be completed about July 1, ready for installation of the light and fog signal.

The following bulletin has been sent out by President Livingstone, of the Lake Carriers' Association: "Owing to the sudden fluctuations of water levels in St. Marys river above the canal, it has been arranged that the lookout at Brush Point will, upon being informed as to the name and draft of a passing vessel, advise whether it is safe to proceed. To avoid possible misunderstanding the master or mate of every downbound boat when passing should call out the name of his vessel and her draft to the lookout on Brush Point, who, in turn, will tell him from the latest information whether it is safe to proceed below Big Point. Masters are requested to follow this procedure and be governed by the instruction they receive from the lookout."

The board of aldermen of the city of Buffalo, after a stormy session recently adopted the recommendation of a sub-committee to purchase the idle islands in the Buffalo river for the purpose of dredging and thereby making a larger winding basin. The purchase price is about $325,000, but it was the opinion of the corporation counsel that the permission of the government must be obtained before the city can go ahead with the removal of the property. At a hearing before the council committee, representatives of the Lake Carriers' Association contended that the removal of the islands should be considered part of the general harbor improvement which includes widening the entrance. The width of the river is declared insufficient, although in point of commerce Buffalo is one of the leading ports.

Towed by the lighthouse tender CROCUS, lightship No. 98, the new craft, which is to take the place of the sunken No. 82 off Point Abino, left Buffalo harbor at 2 p. m., June 13 to take up her new position. The new lightship had on board the full crew of six men and was fully provisioned. She will be stationed about one and one-half miles off the end of the point. The new boat is about 100 feet long and has a turtle deck, with a tubular mast in the middle supporting a lantern. The light will be flashing white, of 1,000 candlepower, every 10 seconds at an elevation of 42 feet above the water. The fog signal is a first-class siren and sounds three-second blasts.

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Red Hot Tips From the Trade

Pertinent Suggestions and Personal Gossip

THE Pneumercator Co., 118 Liberty street, New York, is issuing reprints of a paper read before the American Society of Naval Engineers by Henderson B. Gregory, describing the installation and operation of the pneumercator, an apparatus for measuring the depth and volume of contents of tanks, reservoirs, etc., on shipboard and elsewhere. In this paper it is stated that the pneumercator was first brought to the attention of the navy department early in the year 1913 and an installation was authorized on the battleship New York, in connection with the fuel oil tanks. The fuel oil on the New York is carried in eight double bottom tanks of various sizes and depths. A balance chamber was installed in each tank from which suitable outside connections were led to the indicator gages. Reports from the vessel on the operation of the instrument pronounced it entirely satisfactory.

Auxiliary Light

At a recent session of the board of supervising inspectors, an important regulation was adopted as Section 16, Rule IX, "General Rules and Regulations for Ocean and Coastwise Vessels." This regulation, effective July 1, 1915, reads as follows:

"On and after July 1, 1915, all steamers carrying passengers subject to the inspection of this service, which are provided with a plant for electric lighting purposes, the dynamos of which plant are located below the deep load line, shall have on board an auxiliary plant located above the deep load line, capable of thoroughly lighting the vessel in case of an emergency."

This regulation also applies to steamers navigating on lakes, bays, sounds and rivers.

In order that gasoline generating sets may be used—as this system is entirely independent of other power sources on board ship—Section 4472, Revised Statutes, has been amended to permit that product and other products of petroleum to be carried on vessels for gasoline lighting and wiring systems. The Gas Engine & Power Co. & Charles L. Seabury & Co., Cons., of Morris Heights, New York City, produces such auxiliary generating sets of three, four, seven, 12 and 25-kilowatt capacities, operating 54, 125, 220 and 450, 16-candle-power lamps respectively, or 100, 240, 425 and 850 8-candle-power lamps respectively.

Cascade Circulators

So great has been the demand for Cascade circulators owing to the results said to be obtained in the direction of fuel economy and improved boiler circulation in the many installations already made, that the McNab Co., Bridgeport, Conn., has shipped from its works during a recent month a complete circulator installation for each of the following ships:

Company.	Steamer.	Furnaces.	Boilers.
American-Hawaiian S. S. Co.	Alaskan	12	3
Kinsman Trans. Co.	Matthew Andrews	6	2
Great Lakes S. S. Co.	A. E. Nettleton	6	2
Postal Steamship Co.	T. Barlum	4	2
Postal Steamship Co.	A. E. Stewart	6	2
Postal Steamship Co.	J. J. Barlum	6	2
St. Lawrence & Chicago St. Nav. Co., Ltd.	W. D. Matthews	6	2
Great Lakes Transp. Co., Ltd.	Glenshee	6	2
Boland & Cornelius	Theo. H. Wickwire Jr.	6	2
Standard Oil Co. of California	Standard No. 1 (Tug)	2	1
Lake Erie Trans. Co.	Wm. S. Mack	4	2

Many further orders for this system have been received by the McNab company for early delivery, including equipment for vessels belonging to the American-Hawaiian Steamship Co., Gulf Refining Co. and Western Union Telegraph Co.

Fisherman's Engine

The Sterling Engine Co., Buffalo, N. Y., has issued a circular descriptive of its 12-15-horsepower engine designed especially for fishermen. This engine is made for service. The long stroke of 7 inches is said to enable it to develop large horsepower at slow speed. The engine starts easily and requires practically no attention while running. The approximate fuel consumption up to 15 horsepower is 1/8 to 1/9 of a gallon of gasoline per horsepower hour. It is claimed the motor can be relied upon in heavy weather for severe and continuous service.

Lightship Engines

The contract for lightships Nos. 101 and 102 for the United States government includes two 200-horsepower Mietz & Weiss direct reversible marine oil engines and four 50-horsepower Mietz & Weiss oil engine compressor outfits. This order was placed by the government owing to the satisfactory performance of the 100-horsepower Mietz & Weiss reversible oil engine in lightship No. 98 and a 150-horsepower Mietz & Weiss reversible oil engine in lightship No. 54. The Union Oil Co., of San Francisco, has recently placed an order calling for two 75-horsepower reversible oil engines manufactured by Mietz & Weiss, 128 Mott street, New York.

The name of the Von Hoveling American Composition Co., Ltd., 17 Battery Place, New York, has been changed to The Federal Composition & Paint Co., Ltd. The business will be conducted under the same management and at the same address as heretofore, by the same method—the Von Hoveling process.

The sixth issue of *The Live Wire*, published by the American Ship Building Co., contains considerable interesting material including a valuable article on office details by O. J. Fish, secretary and treasurer of the company, and an account of the trial trip of the steamer NORONIC by A. W. Cross.

The International Oxygen Co., 115 Broadway, New York, has declared a dividend of 6 per cent. While the business of the company is not all that could be desired, the board of directors believe that the surplus earned last year was sufficient to justify the distribution.

The United States army dredge Comstock, recently launched at the yard of the Ellicott Machine Corporation, Baltimore, Md., has two Scotch boilers equipped with Eckliff circulators, supplied by the Eckliff Automatic Boiler Circulator Co., Detroit, Mich.

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Equipment Used Afloat and Ashore

Breezy, Terse, Illustrated Descriptions of New Devices for Deck, Cabin and Engine Room—A Cutting and Welding Torch—Motor for Life Boats

A RIVETING hammer and rivet set retainer, which are designed particularly for use on ships, have been brought out recently by the George Oldham & Son Co., Frankford, Pa., manufacturer of pneumatic tools and appliances. They embody a number of interesting features.

In the new style riveting hammer, shown in Fig. 1, springs are used to absorb the shock from the blows of the hammer. It is claimed that the strains on the other parts of the hammer are considerably reduced. The handle is clamped in a manner which prevents it from coming loose. The

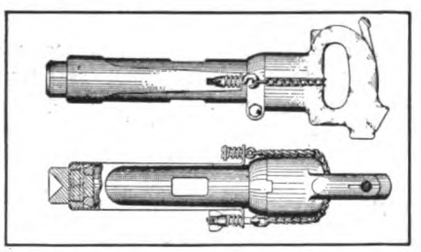


FIG. 1—NEW RIVETING HAMMER

throttle construction of the new hammer, it is claimed, increases the efficiency and reduces the possibility of leakage. The hammer is being built in three sizes, 6, 8 and 9 inches. This type of riveting hammer is said to be 1½ pounds lighter than the aver-

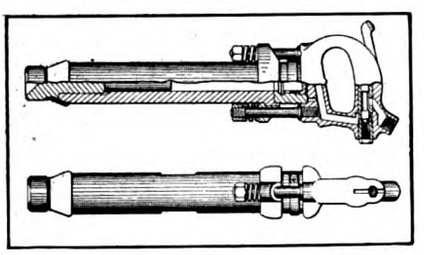


FIG. 2—HAMMER WITH RETAINER

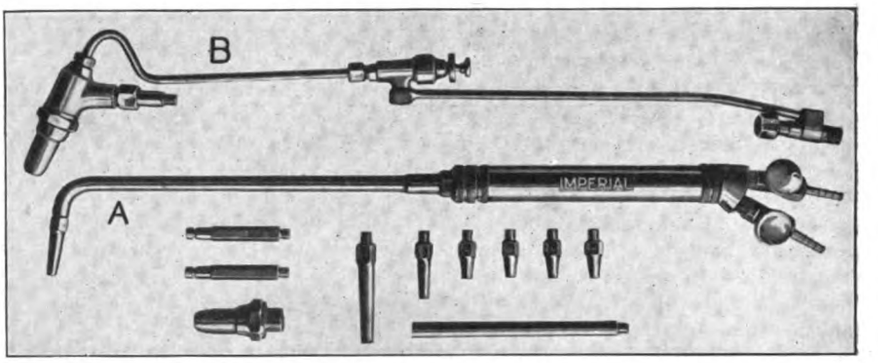
age hammer of the same piston stroke.

The details of the safety rivet set retainer are shown clearly in Fig. 2. The retainer weighs two pounds and can be used on a pneumatic hammer of any design. One of the chief advantages claimed for the retainer is its flexibility.

Power Lifeboats

On July 1, the law requiring the use of power lifeboats on ocean-going steam vessels goes into effect. This law provides that "all ocean steam vessels of over 2,500 gross tons, carrying passengers and whose courses are 200 miles or more off shore, shall be required to be equipped with not less than one motor-propelled lifeboat as part of their lifeboat equipment; provided, however, that any vessel under the jurisdiction of this service may be allowed to carry one motor-propelled lifeboat as a part of the lifeboat equipment required on such steamer, except that on steamers carrying more than six lifeboats under davits, two of such lifeboats may be equipped with motors".

The Gray Motor Co., Detroit, Mich., recently has developed a four-cylinder engine of 3¾-inch bore and 4½-inch stroke, which can develop 16 to 20 horsepower, and is claimed to be especially adapted for service on this class of power boats. This engine is compact and light enough for installation on an 18-foot boat and has sufficient power for a 30-foot boat. The Gray engine is shown in the accompanying illustration.



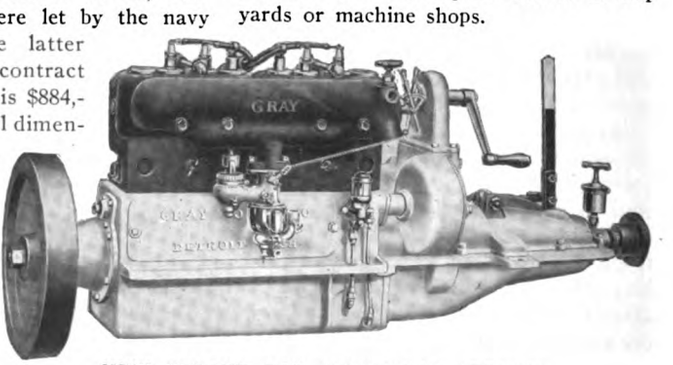
COMBINATION TORCH ARRANGED FOR WELDING, WITH CUTTING ATTACHMENT REMOVED

U. S. S. Wadsworth

The destroyer WADSWORTH, is one of a class numbered from 57 to 62, contracts for which were let by the navy department in the latter part of 1913. The contract price of the vessel is $884,000 and the principal dimensions are as follows: Length, 315 feet 3 inches; beam, 29 feet 10 inches; mean draft 9 feet 3 inches; displacement on trial, 1,050 tons; contract speed 30 knots. The peculiarity of this destroyer is that it is the first one in the United States navy to be entirely driven through gearing. The main propelling turbines are of the Parsons reaction type, and drive twin screws by means of helical pinions and gears.

Welding Torch

A combination cutting and welding torch for use in connection with oxy-acetylene systems has been developed recently by the Imperial Brass Mfg. Co., Chicago. The torch is said to be particularly adapted for small repair jobs on ships. The principal features of the new torch are shown in the accompanying illustration. It is so designed that it can be changed from welding to a cutting torch by removing the welding head, *A*, and putting the attachment, *B*, in its place. The cutting head, it is said, will cut wrought iron or steel up to four inches in thickness. The welding torch is suitable for welding operations and particularly for use in connection with the complete oxy-acetylene outfit manufactured by the Imperial Brass Mfg. Co. The latter is sufficiently portable for use on board ship as well as in ship yards or machine shops.



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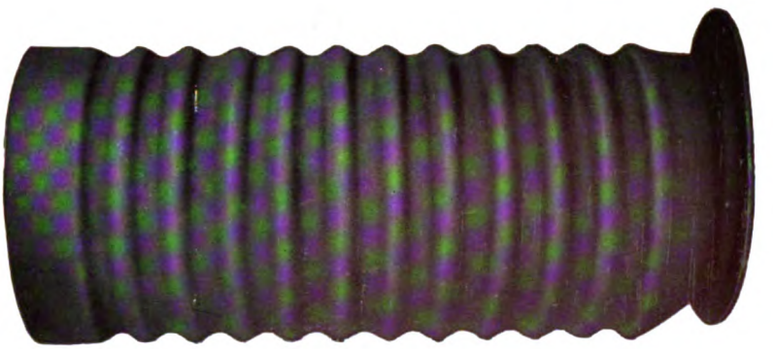

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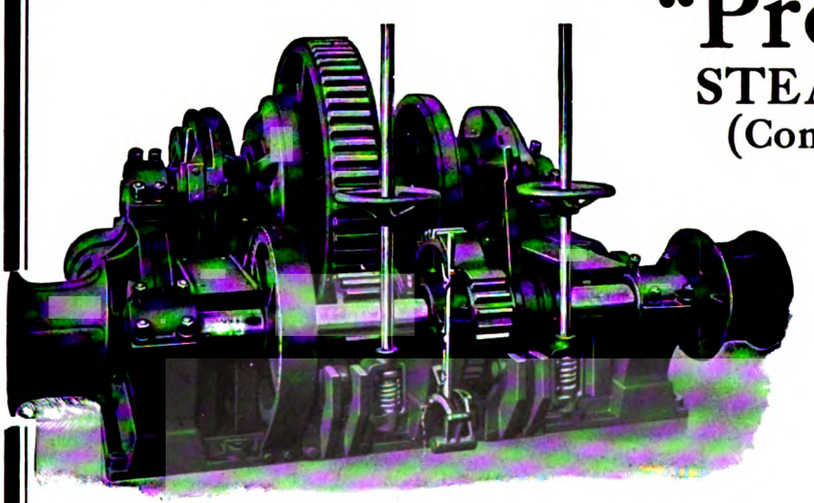

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